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The OIL WEEKLY

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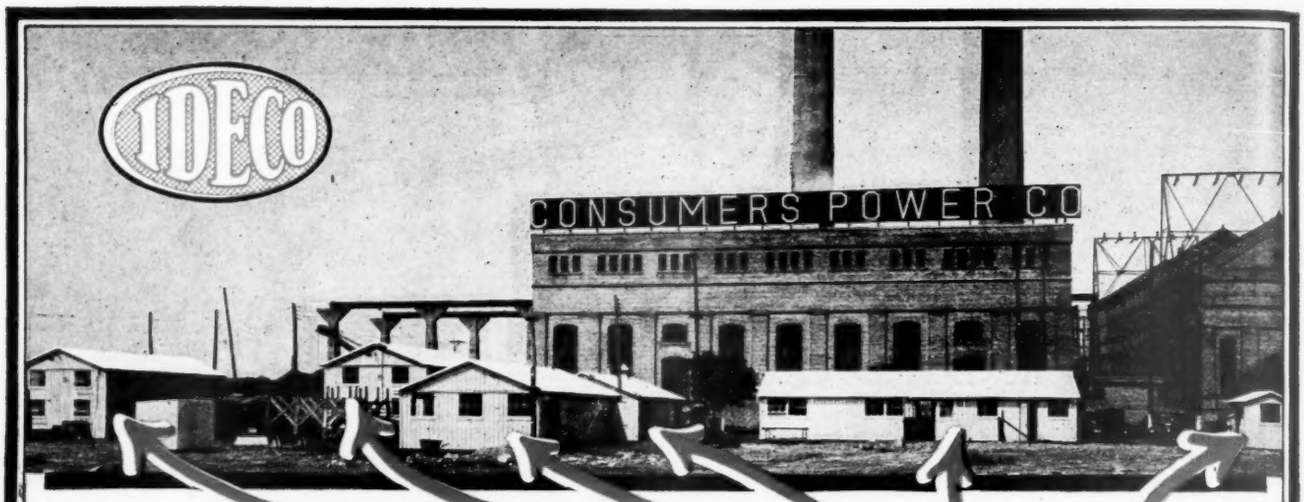

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Rising Light Oil Production Checks Further Market Improvement

By H. J. STRUTH
Petroleum Economist

IN the face of numerous declines in daily average production, it is apparent that the output of light oil, particularly in California, is rapidly becoming a factor in the general petroleum situation. Another sharp gain in light oil production in California and a spurt in Eastern output resulted in another gain in the country's daily average crude production for the week ending December 1. Increases reported in California, Eastern fields and Kansas, aggregated 14,450 barrels. Oklahoma, Texas, Gulf Coast, Arkansas and the Rocky Mountain fields showed a decline of 13,300 barrels, resulting in a net increase for the United States of 1150 barrels. As a matter of fact, the production of light oil is more than offsetting the declines registered in some of the major producing areas. The effect of this is being reflected in many of the refining centers, where light oil is being used to the exclusion of heavier grades formerly used. This is resulting in higher gasoline yields per barrel of crude run to stills, therefore bringing about a natural curtailment in refinery runs. It is also noted that there is a decided increase in cracking plant operations, which, combined with the use of high gravity crudes, is accelerating the gasoline output of the refineries. All of this indicates definitely that we can expect a sharp decrease in refinery crude demand. At the present time, quite a number of the refineries are cutting their crude run schedules.

Higher Recovery

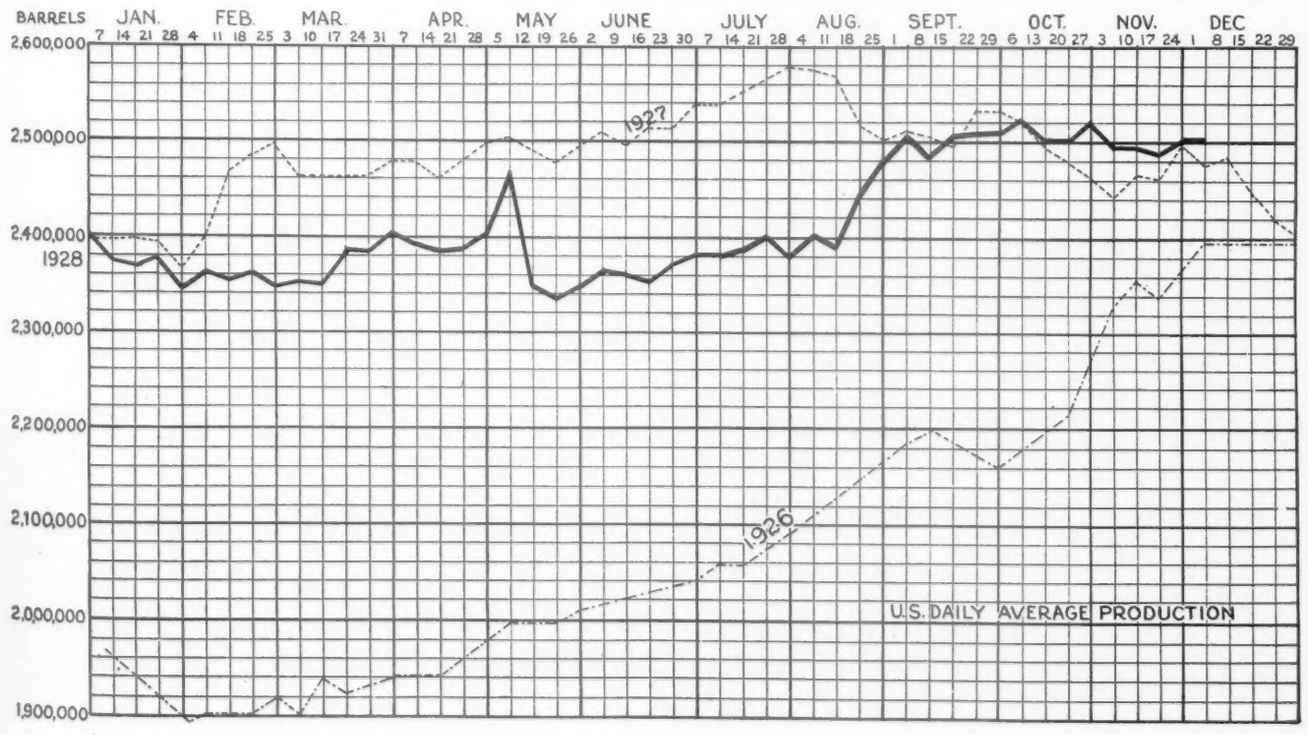
Analysis of the Bureau of Mines report for October, 1928, reveals a marked increase in the yield of gasoline. In May the refineries were obtaining an average of 36.18 per cent. of gasoline from crude. During October, the yield increased to 38.99 per cent. a gain of 7.19 per cent. in five months. This shows concretely what can be done in the direction of producing a greater amount of gasoline from less than the usual quantity of crude run to stills.

In order that report of the more important proceedings of the American Petroleum Institute at Chicago might be included, this issue of The Oil Weekly is one day late in getting into the mails.

It should also be borne in mind that many refiners have been accumulating large stocks of gas and fuel oils during recent months, in order to maintain a high crude still run schedule. Now, when runs are being curtailed, these refiners are beginning to crack their surplus stocks of gas and fuel oils, resulting in a sharp gain in gasoline output and a falling off in demand for new crude supplies. Particular attention is called to the marked increase in cracked gasoline output, as reported by the Bureau of Mines: In April the quantity of gasoline produced by cracking heavy oils was 386,568,000 gallons; May, 399,672,000 gallons; June, 405,216,000 gallons; July, 445, 578,000 gallons; August, 461,538,000 gallons; September, 476,784,000 gallons; October, 484,344,000 gallons.

The Oklahoma crude market is in a better condition at this time, due largely to the running of larger amounts of oil to stills at the refineries. Although a few weeks ago, considerable was heard about a possible increase in the price of light crudes, these rumors have now completely died out. Oklahoma operators now seem to believe

UNITED STATES CRUDE PRODUCTION TREND



AMERICAN PETROLEUM INSTITUTE OFFICERS NAMED

The following officers were elected by the board of directors of the American Petroleum Institute:

President: E. B. Reeser, president of the Barnsdall Corporation, Tulsa, succeeding E. W. Clark, executive vice president of the Union Oil Company of California, Los Angeles.;

Vice-President representing manufacturing: J. Howard Pew, president of the Sun Oil Company, Philadelphia;

Vice-President representing production: K. R. Kingsbury, president of the Standard Oil Company of California;

Vice-President representing distribution: Henry M. Dawes, president of the Pure Oil Company, Chicago;

Executive Vice-President: W. R. Boyd, Jr., New York;

Treasurer: Amos L. Beaty, New York;

Secretary and assistant treasurer: Lacy Walker, New York.

Members of the Executive Committee, in addition to the president and the three vice presidents, the treasurer, and the last retired president, who are ex-officio members are:

Axtell J. Byles, president Tidewater Associated Oil Company;

R. W. Stewart, chairman of the board of Standard Oil Company of Indiana;

W. C. Teagle, president Standard Oil Company of New Jersey;

George S. Davison, president Gulf Refining Company, and William N. Davis, vice-president Phillips Petroleum Company.

The following were elected to the Board of Directors:

Pacific Coast Production Group—W. M. Storey, Standard Oil Company of California, San Francisco; L. P. St. Clair, Independent Oil Producers Agency, Los Angeles, and D. S. Ewing, Ethel D Company, San Francisco.

Pacific Coast Manufacturing Group—H. R. Gallagher, Shell Company of California, San Francisco.

Pacific Coast Distribution Group—K. R. Kingsbury, Standard Oil Company of California, San Francisco.

Central United States Production Group—W. S. Farish, Humble Oil & Refining Company, Houston.

Central United States Manufacturing Group—Roy B. Jones, Panhandle Producing & Refining Company, Wichita Falls, Texas.

Central United States Distribution Group—L. L. Marcel, White Eagle Oil & Refining Company, Kansas City.

Eastern United States Production Group—Axtel J. Byles, Tidewater Associated Company, New York.

Eastern United States Manufacturing Group—W. E. Smith, Standard Oil Company of Kentucky, Louisville; Edward Prizer, Vacuum Oil Company, New York, and Frank B. Fretter, National Refining Company, Cleveland.

Eastern United States Distribution Group—Amos L. Beaty, New York;

Transportation Group (Ships)—J. Howard Pew, Sun Oil Company, Philadelphia; Transportation Group (Pipe Lines)—C. H. Kountz, Prairie Pipe Line Company, Independence, Kansas;

Supply Group—John S. Carrol, Johns Manville, Inc., New York;

At-Large Group—D. H. Moran, Marland Oil Company, Ponca City, Oklahoma, F. B. Henderson, Associated Oil Company, San Francisco, S. A. Guiberson, Jr., Guiberson Oil Investment Company, Los Angeles, and W. G. Skelly, Skelly Oil Company, Tulsa.

The At-Large Group was increased by one member and George P. Whaley, Vacuum Oil Company, was elected to fill this place.

The directors elected the following "Directors-at-Large": J. C. Van Eck, Shell Union Oil Company, New York, and E. W. Marland, who was chosen to fill the vacancy created by the death of George H. Jones, Standard Oil Company of New Jersey, and the following were re-elected: E. R. Brown, Magnolia Petroleum Company, Dallas, and H. M. Dawes, Pure Oil Company, Chicago.

The membership committee elected comprises the following: Roy B. Jones, chairman, L. P. St. Clair, P M. Miskell, W. M. Irish and E. T. Wilson.

that no increase in the crude market may be expected before next spring. There are no immediate threatening fields in the state. Production should continue to show small declines until February 15, at which time the Mission pool will be opened up. There are now 12 producing wells (all pinched) in the field, with approximately 100 drilling tests. The new Wilcox sand pool, located on the west side of the St. Louis field, is not expected to prove a menace to the crude market. It apparently will have a small recovery, and cover only a small producing area. Water is already making serious inroads on the half a dozen completed Wilcox sand wells. The next few weeks will see many wells completed in the west half of the Maud district, where the Misener and Hunton lime formations have been found highly productive, but these producing horizons have never before proven a big market factor and are not expected to in this case, although they will somewhat offset the decline of production in the Greater Seminole district.

Greater Seminole crude oil production continued to slump. It reached a new low on Friday of 279,469 barrels. The decline of Seminole production is an important factor in the market. Early estimates were that the production of this district would be approximately 275,000 barrels by February 15, (when Mission will be allowed to start producing openly) but this estimate now seems a trifle high. If Seminole should take a big tumble by that time, the Mission district would not prove such a big factor. St. Louis production jumped to a new high of 134,612 barrels.

The refined market in Group 3 was unsteady during the past week. There was a wide margin in quotations on new navy gasoline. Some refiners were selling 58-60, 437 end point, gasoline as low as 8¼ cents, while some were asking 9¼ cents for the same product. This is a general reduction of one-quarter cent from prices of the preceding week. Continual running of large amounts of crude to stills, which caused an over production of gasoline, brought about the wide spread in prices. 60-62, 437 end point, gasoline was being quoted by various refiners at prices ranging from 9 to 10 cents per gallon. 64-66, 375 end point, was being sold as low as 9¼ cents a gallon by a few refiners, while others were getting better than 10 cents.

Kerosene also showed a slight reduction in prices during the week. 41-43, water white grade, was being quoted at 5½ and 5¾ cents, or a quarter of a cent lower than during the preceding week. Other grades of kerosene were off in proportion.

Natural gasoline market was steady, with C and BB grades selling for 8½ cents, and A grade as high as 9 1-8 cents.

The general tone of the market showed a tendency to weaken, although some refiners were optimistic over the possibilities of a stronger market. This attitude is due to the belief that there would be a reduction in runs of crude to stills very shortly, Thus far, however, this has amountd to nothing but talk, which will not improve the market.

West Texas

Expansion of facilities to market more oil from various Texas fields was greatly in evidence during the past week, with three more skimming plants for the west Texas district in prospect, Humble Pipe Line Company started stringing pipe and organized two construction crews to speed up the completion of a 75 mile eight-inch line to connect the Boggy Creek field, Anderson County, with its trunk line system at Groesbeck station. Humble Oil & Refining Company is largely in control of this high gravity oil area and gave the field an important extension late last week with a big well.

The Del Rio Refining Company has been organized as a subsidiary of the Amarillo Producers & Refiners Corporation, which is operating refineries at Pyote and Borger, Texas, to start work

(Continued on page 92)

A. P. I. Makes Constructive Organization Plans

E. B. Reeser named president as outside leader idea is discarded; vice-presidents elected to represent three major branches

By SPENCER W. ROBINSON

CHICAGO.—At an executive session of the board of directors of the American Petroleum Institute Wednesday, steps were taken that will ultimately establish the work of the Institute into three general classifications, representative of the three major branches of the industry. It was the directors' opinion that the present scope of the Institute was of such extent as to prove unwieldy under the old method of operation. The new break-down in the Institute's operations was announced in the form of three vice presidents elected to represent the three important branches of the industry namely: production, manufacturing and distribution. The three branches have been represented in the Institute for a number of years through representative groups on the board of directors.

No definite action has been taken at this time to organize the three divisions, although such a move was expected before the four-day meeting closes here Thursday night. Should the plan be effected at this time it will mean that the work which has been conducted under the previously established divisions will be assigned to the proper branch of the above three designated groups.

No Outside Leaders

Suggestions to the effect that the industry should seek someone outside of the industry and of sufficient prominence to command the respect of the entire industry as well as the public, to serve as director general of the Institute, were given little consideration, and the nominating committee again selected one of the industry's own leaders to serve as president for the ensuing year. E. B. Reeser, president of the Barnsdall Corporation, Tulsa, was elected president of the Institute to direct the organized effort of the industry during the coming year.

Mr. Reeser was one of the first to take steps to bring about rationalization in the industry and has been prominent in all meetings where efforts have been made to curtail production in both this and foreign countries.

Mr. Reeser will have as vice president, representing manufacturing, J. Howard Pew, president of the Sun Oil Company; vice president, representing production, K. R. Kingsburg, president of the Standard Oil Company of California; vice president, representing distribution, Henry M. Dawes, president of the Pure Oil Company.

The new office of executive vice president was established with W. R. Boyd Jr., serving in this capacity.

Amos L. Beaty of New York, was re-elected treasurer, and Lacy Walker of the Institute staff will serve in the capacity of secretary and assistant treasurer.

It had been expected that the board of directors would make further recommendations concerning the report of the "Committee of Nine" on the subject of conservation, but up to this time this subject has not come before the board for consideration.

Most of the time of the directors so far has been confined to drawing and passing the customary resolutions, with most of Wednesday being devoted to the study of the proposed code of marketing practices as recommended by the committee appointed last year to study this problem—A petroleum industry code of marketing practices, culminating three months' work of 65 men representing seven regional chairmen and their respective subcommittees, was unanimously approved by the board of directors and presented in convention today. Copies of the code will be distributed before the meeting reconvenes at eight o'clock, at which time the code will be discussed from the floor before final acceptance. Before the reading of the code by Roy B. Jones, Panhandle Producing & Refining Co., chairman, general committee on code of ethics. George S. Davison, Gulf Refining Co., Pittsburgh, Pa., reviewed the work of the regional and subcommittees. Pointing out that more than 65 men had worked for more than three months preparing drafts of codes, which in turn were discussed and revised by the regional committees before being presented for ratification by the board of directors, Mr. Davison said that "The result of this work is the most important step that has ever been taken by our industry. The preparation of this code is important not only in itself but that it will make all other unsolved problems seem easier."

The meeting officially opened at the first general session held in the Stevens Hotel here Tuesday afternoon. Axtel J. Byles, president of the Tidewater Associated Oil Company presided in the absence of E. W. Clark, president of the Institute, who was unable to attend the meeting. There were three speakers on the program at the opening and all touched upon the vital problem of bringing about an effective and immediate means of cooperation for the curtailment of excess production, the ever present evil of the industry. Axtell Byles struck the keynote of the meeting in his paper on rationalizing the oil business. He told the gathering that uneconomic competition and the increase of production to the maximum capacity, of which wells in this country are capable, would wreck the oil industry. He urged that the industry declare peace with itself. "The oil industry cannot be profitable if it continues in alternate

(Continued on page 48)

Named President A. P. I.

E. B. REESER

Petroleum Problems Outside the United States

By SIR JOHN CADMAN
K.C.M.G., D. Sc.

Speech delivered at the Annual Dinner of the American Petroleum Institute, December 6, 1928, Chicago.

SIR JOHN CADMAN, chairman of the board of directors of the Anglo-Persian Oil Company, on his arrival at Chicago to speak before the American Petroleum Institute, gave out the following statement: "As a visitor to the United States, I cannot claim to be an exception to the rule. Like most of my fellows I invariably find in such a visit a stimulus and a refreshment in the western hemisphere. It is our constant endeavor not to be parochial; not to be merely national; not, indeed, to be purely hemispheric in our outlook; as best we can we try to remember that there was a world before there were countries. But sometimes it is difficult, and a visit to our friends in the United States is like the opening of many windows to restore the slightly oppressed atmosphere of a fine and stately old mansion.

Among friends one should never hesitate to talk frankly about one's own difficulties, therefore I have come to discuss some of our "Petroleum Problems Outside the United States."

What is the real place of nationalism in the realm of petroleum? When great potential production is found in country after country which has no great local market and is therefore in no way comparable with the United States, how far is it possible to make readjustments for the benefit of all parties—in fact for the benefit of the entire population of the globe?

It is possible that individual organization in the oil industry has over reached itself and that we are now suffering from sheer over organization with as a resulting loss of efficiency?

What real justification, if any, is there for perforating the surface of the world with wells and peppering it with tanks and refineries in order to fill them with oil not immediately required for consumption, which could far more safely and far more cheaply remain underground?

What lessons are to be learned from that most fortifying spectacle of international cooperation, namely Iraq, where representatives of the United States, of France, of the Royal Dutch Shell group and of the Anglo-Persian Company are for this purpose now constituted one body?

Without promising to answer all these questions, I offer them to you as indicating considerations that must be present in my mind when I respond to the invitation to address the American Petroleum Institute on "Petroleum Problems Outside the United States."

IT is now nearly seven years since last I had the pleasure of addressing you. As we all know, it is the thing done, not the thing said, that avails.

In venturing, therefore, to offer you a few observations upon "Petroleum Problems Outside the United States." I must begin by referring to something that is a problem no longer, and in respect to which I hope I may claim that it now falls into the category of things done, and done with, once and for all. I revert to a topic which claimed a good deal of attention eight years ago. For purposes of convenience I will call it "The Open-Door" question; although that name now sounds strangely out of date, and for the very good reason that so soon as a door is discovered not to have been locked, it immediately seems to lose its power to interest and excite.

In the general confusion of thought—touching every phase of national and international intercourse—which succeeded the Great War, national opinions and ambitions were for a time almost impossible to reconcile. In fact, I sometimes tremble even now to think what might have happened if the difficulties of 1919 and 1920 had been allowed to harden, and if the statesmanship of 1920 and 1921 had never been permitted full play. In fact, I cannot tell you with what delight I am able to stand here now and write the word "Finis" on that chapter of misunderstanding and potential divergence whose name is Iraq—but once was Mesopatamia—that blessed word which so comforted the old lady when she heard it in a sermon, but which for a time acquired a significance anything but blessed for the British and American peoples. Mesopotamia has now given place to Iraq—a symbol of union and not of division.

Iraq

For the first time in history you now find the world-representatives of a very great industry standing side by side and aiding a country's development; and that a country (I mean Iraq), in which agreement among the stimulating influences of the West is somehow the very last thing you might expect. The United States is in with the others, and for good. We offer them an unaffectedly hearty welcome.

For this result we have many people to thank. Forgetting for a moment my executive resposibility for the Anglo-Persion Oil Company—and thinking with that responsible aloofness which invested the official position I occupied immediately after the Great War—I feel bound to give a special word of praise to those who have been responsible for the policy of the Anglo-Persian Oil Company from the very inception of the Iraq question until the recent entry of the United States to its place in the Iraq petroleum company. The Anglo-Persian had special claims, and its shareholders undeniable rights; and in fairness to the board of that company let us recognize that in this matter they have not stopped short at talking about Britain's "open-door" policy; in so far as a commercial concern can help to give a signal demonstration of it, they have done so.

Leaving this subject, let me just emphasize two facts. One is that no single event has caused me higher gratification from a personal point of view than the successful outcome of such efforts as I was able to make—over a good many years—towards smoothing the path for that community of interest now represented in the Iraq petroleum company. The other is that for the message I am anxious to deliver tonight I claim, without any hesitation, all the force that is added by reason of the fact that in some measure I am your own spokesman—since I act as chairman of a great corporation in which the United States is very substantially interested.

I am aware that in certain secondary matters and in other geographical areas there may still be different points of view requiring adjustment; but, regarded as a paramount issue, the "open-door" ques-

tion, though once it may have presented something extraordinarily like a problem, most certainly does so no longer. You will believe that I for one take leave of it without tears.

And now I proceed at once to dismiss the greatest of our extra-U. S. problems —one having its origin within the United States itself. I speak, of course, of that United States whose boundaries elude the cartographer because they extend as far as any barrel of U. S. oil is transported for distribution today. In 1922, if statistics can be relied upon, the United States of America absorbed her own entire production, partly by consuming it within her own borders, and partly by adding to her stocks. Moreover, to the extent of tens of millions of barrels, she imported more than she actually exported. By 1927 she had not only forgotten to be, on balance, an importer, but the excess of her exports over imports equaled almost exactly one-quarter of the production of the rest of the entire world—and that, mark you, in a year when as producers such countries as Russia and those of the South American continent had outrun all previous bounds.

Here let me make one reference of a quite personal nature. I have never echoed the prophecies of doom that were so fashionable, just after the Great War, in relation to adequacy of reserves within the United States and elsewhere. On the contrary, I did not hesitate to run the risk of forfeiting any reputation as technologist I may have had, by pronouncing plainly in the other direction. That was the best part of a decade ago—and now events have superseded prophecy, and with such a result that I feel rather like the farmer who, after praying for rain and getting a deluge, looked up towards heaven and simply said, "This is ridiculous."

The Future

As to the future, on the one hand, we have it on record that in the years 1920 to 1922, among technical and geological opinion in the United States many voices were raised in warnings of a virtual exhaustion of the United States' resources within the comparatively brief period of 20 or 30 years. On the other hand, an eminent authority (he may be present tonight), whose opinion was received with great respect at the Fuel and Power Conferences held two months ago in London, estimating the number of years upon which the world can rely for its gasoline, has pitched his figure as high as 3000. So various can be the rewards of searchers after truth!

When I was last in America, I made the two following statements:

> "The Petroleum Industry has learned its responsibility to the public. . . . Its members must get together to promote its welfare." Again, I said this: "The economic laws which control supply and demand are incontrovertible, and any attempt to interfere with them would undoubtedly lead to chaos and inefficiency."

The truth of these statements is not perhaps self-evident at first sight. The laws of supply and demand, it may be suggested, are inexorable—and scarcely likely to submit to the corporate will of the oil interests, however resolute, however altruistic, and however highly-informed that will may be. I must ask you to bear with me while I probe to the heart of the matter.

The commoner applications of the laws of supply and demand are as familiar to us as the dark and the daylight. Taking as an instance the basic necessaries of life, the total food requirements of a given community can easily be calculated by reference to racial history; to an occupational census; to current social and physical conditions; and to the prevailing climate. Variation there undoubtedly is, within limits. But, beyond a certain point, produce or import as much food as you will, consumption will not increase. Of clothing the same thing may be said; and as to houses, after supplying the needs of the multitudes now inadequately housed, mere cheapness of production could do little to raise the *total* number of houses occupied.

Rates of Expansion

In relation to the commodities with which we are most familiar, therefore, an expansion of supply accompanied by a fall in price may be said to have this effect: in regions of consumption where requirements are already substantially met, absorption may be stimulated to a reasonable degree; where deficiency has prevailed, it may be ameliorated and possibly abolished. But beyond the ratio of expansion which I have suggested, increase in supply remains quite powerless to enhance demand. Save for the glutton, the mere existence of a plethora of food will tempt few of us to a sixth or seventh meal per day. Except for the aboriginal denizen of Africa, the number of suits of clothes which any one mortal can becomingly wear at any given moment is relatively small—if for the purposes of this illustration I may exclude beads from that category! You will, I am sure, forgive me if I forbear to expound or even touch upon the incidence (if any) of these laws upon mere matters of drink!

I would point out, also, the relationship which exists in some degree between the value to the user of the thing produced and the expenditure of human energy demanded by its production. Surely, from earliest ages, the tilling of the soil; the sowing and the reaping of the harvest; the shearing of the sheep; the winnowing of the corn, have been proverbial symbols of the unremitting toil without which not one loaf and not one garment can be added to the store of human apparel or the sum of human sustenance.

This fact, therefore—I mean the regular amount of added human effort needed to increase the sum of production—exercises an effect almost equal to that which, as I earlier suggested, restricts fluctuations in demand. In short, the supply of these things involves a fairly regular cost, whether the unit taken be the hundredth or the billionth; any significant increase in demand is of slow growth, and upon real over-production a prompt check is imposed.

So much for the commoner things of daily life.

The dawn of the oil era seems to me to have inaugurated a group of new conditions. Its influence is not simple: it is complex. Oil has quickly thrust itself forward not only into the fro it rank, but through and beyond the front rank, of world commodities. Epitomizing the necessaries of life, we employ neither fancy nor humor if nowadays our symbols are a sheltering roof; a bowl of wine; a loaf of bread; and a gasoline pump. Of these four, each of the first three represents a definite number of units of human energy spent in the construction or production of its every particle.

But of the spirit in the gasoline pump and all it connotes, what shall we say? As a measure of the human vitality that is *sometimes* sufficient to produce it, we might refer to the words used by the then chairman of the corporation which owns one of the richest single fields in the world. He explained that, in that particular oilfield, in order "to secure the production of crude required for export, all that has to be done now is to open the necessary number of valves by means of which the production of crude can from day to day or from hour to hour be regulated to our requirements to a nicety, just as regularly and as accurately as when one turns on the water for one's bath." So, since we always seek to symbolize these things, the proper smybols of the toil involved in winning from reluctant Nature the necessaries of human life are the ploughshare, the sickle—and the bath-tap!

Limits of Utility

Gentlemen, it is a fact of the first importance that the face of the globe is now drenched with a commodity, which, although necessary to life, involves but an irregular and sometimes meagre expenditure of life in its primary production. New uses for it spring up overnight. No man can foresee the ultimate limits of its utility. The ancient sources of light and heat—for example, coal—have had to take account of it, and may well have to come to terms with it.

Here is one of the essentials of life, therefore, of which it can be said that it betrays an economic characteristic that is novel—almost unique. In short, the supply not only stimulates the demand: within limits, it creates it. In large measure, accessibility and cheapness of supply stimulate consumption with a directness for which no precedent can be found in the entire history of industry. But, none the less, there *are* limits, and there *is* a penalty for exceeding them. The checks imposed upon excess, although far from automatic in their incidence, are frequently not so much corrective as punitive in their effect. The limits of economic operation are hard to trace and impossible to fix with permanence. Many operators are therefore tempted blindly to ignore them, although to overrun them is to invoke Nemesis.

To the confusion of thought which I have described is directly due the possibility of "over-production," with all its

attendant evils. I expect that whenever you hear that word it induces in you a sense of fatigue, and I shall be as brief as possible in dealing with it. Nevertheless, there is no escape from it; because, beyond as well as within the United States, it is one of the most urgent, although not in fact the most vexatious of all our problems. Given a proper appreciation of the laws to which I have referred, it ought never to have arisen. I suppose, however, it is not really surprising that many minds should have been mesmerised by the idea that the greatest and quickest production of this marvelous new commodity must somehow be the best thing for mankind as a whole; so resilient appears to be the demand, so far remote the industrial saturation point. But it is high time for us to seek and to spread some enlightenment on this subject.

In the light of all these considerations, let us examine the statistics of the last few years.

Production Increases

Among producing countries other than the United States, there are several to which a special importance attaches by virtue of their production and distribution. During the last six years, only one of these countries, namely Mexico, has not shown an increasing output. In 1922, Mexico produced some 27 million tons of crude, and ranked second among the world's producers; by 1927 her production had fallen to nine million—an almost phenomenal decrease of 18 millions. Nevertheless, Mexico still remains an exporter of oil and a considerable factor in the world's petroleum affairs. To the extent to which production exceeds consumption, however, it finds a natural export market. On the other hand, great productivity, both actual and potential, was revealed elsewhere. In Iraq high possibility developed into definite potentiality—a fact of which in due course we shall all have to take account.

In six actual producing countries, a survey of the years 1922 to 1927 shows the very opposite of that which has occurred in Mexico. In 1922, Venezuela and Colombia together produced less than 400,000 tons of crude. By 1927, production had risen to over 11 million, and they had become exporters, sending their produce chiefly to other countries in America and to Europe.

In Roumania, during the period, production has nearly trebled, the figure for 1927 being over 3½ million, of which about two-thirds were exported to Europe and Africa.

The production of Russia, also, has grown during these six years, thus in some measure recovering pre-war dimensions. Its output of crude in 1922—4½ millions—was more than doubled in 1927, and the exportable surplus of Russia's products—like that of Roumania—also found its principal outlets in Europe and Northern Africa.

The Dutch East Indies—an old-established and stable producer—is less remarkable than some in its recent fluctuations. Production there has increased by only one-third, to 3½ million tons; but the ultimate distribution of oil from these islands, although mainly concentrated in Asia, reaches also to the extreme points of England and Australia.

In Persia—a country of whose petroleum affairs I can speak with a measure of authority—production has risen from 2¾ to 5¼ millions—a rise strictly regulated in terms of the internal consumption, which is low, and of the steadily increasing export demand, which is far from low.

Exports From Persia

One-half of the quantity exported from Persia is consumed in Europe. The more adjacent markets of Asia and Africa absorb 30 per cent.; and fractions of the remainder are widely distributed about the globe, some to Iceland and some past the Dutch East Indies to Australia—a dispersal which I for one would be pleased to see undergo some concentration.

The seven countries I have mentioned are—after the United States—the principal producers of the world. Taking them as a whole and setting off the decreased production in Mexico against the increases elsewhere, in 1927 as compared with 1922 there was a net increase in production of about five million tons. Moreover, in all the producing countries of the world, other than the United States, production has increased to the relatively small extent of some seven and one-half millions in the space of six years; whereas the increase in the United States is no less than 47 million tons.

I revert for a moment to Persia, where a useful illustration of my argument may be found. I can assure you in all seriousness that in that country, where the ultimate resources are far richer than it would be proper for me to indicate to you, exhaustion of an economic, if not of a material character would have been reached in a comparatively small number of years if, unfortunately, Persia had become a focus of just such economic conditions as have prevailed in certain other countries.

Compare with that the picture of the results of offsetting, say in Roumania, or in Venezuela. Looked at in world terms, the thing is an economic scandal.

To this audience, fresh from the experiences of the last few years, I suppose it is scarcely necessary to suggest—as I have done from another platform—that in the long run "it profits nobody that there should be alternate waves of overproduction and under-production, of high prices and low prices, of big profits and of little or no profits."

I can speak feelingly when I say that particularly in that part of the extra-U. S. world which still suffers from the Great War and its aftermath, these conditions of instability are most deeply to be deplored. I would address myself now, not only to this audience, but to any other listeners whom my words may ultimately reach. Surely the present generation will realize that oil is no longer to be regarded as a new, a potent and a fascinating toy. Are we not—and I refer particularly to those of us who have some pretensions to scientific knowledge—are we not, in our generation, the trustees and store-keepers for posterity? I do not hesitate to say that the effect of the methods adopted in recent years in certain centers of spendthrift production amounts to a robbing of the birthright of future generations. Gentlemen, we must realize that in dissipating natural resources in this way, we are not only squandering the revenues of our contemporaries. We are, in fact, destroying for all time one of the most precious *capital* assets of Mother Earth.

In violent contrast with these "methods of barbarism," what a relief it is to think for a moment of the sanity and sense to be brought permanently to bear on the oil problems of Iraq! Breadth of outlook and unity of aim will, of course, be invaluable when that country becomes a substantial producer. In terms of present indications, it is feasible to contemplate a volume of production amounting to some millions of tons in the relatively near future—say four or five years hence. If and when that comes about, there is no doubt that the office of trust accepted by all those nations interested in the development of Iraq will require that an outlet, and a permanent outlet, be found for Iraq's production. This problem is one in which we are all interested, and not only the primary problem, but all its consequential issues will have to be taken into account by the principal parties.

With the agreeable thought of Mesopotamian co-operation uppermost in our minds, I now with your permission take leave of the vexed question of world-production—although only for a few minutes.

Storage Facilities

A factor of increasing menace outside the United States is the absence, so far, of any recognisable policy governing the extent of storage facilities. Up to date, the number of tanks, for example, has always been settled in a manner purely arbitrary, by reference sometimes solely to potential production; sometimes to distribution; and on other occasions without reference to any ascertainable principle whatever. All this was understandable during the period of the industry's economic minority, so to speak; but when, as now, it has attained to years of discretion as a world industry, something a little more rational would be only decent. Without attempting to dogmatise, in a "Parliament of Oil" I would gladly suggest as the starting point for debate this motion:

> "Resolved that we keep in view as a guiding principle one dominating factor, namely, the desirability of conserving deposits, once discovered, not in imperfect containers constructed on the surface of the earth, but, so far as practicable, in that great and perfect reservoir which Nature herself has provided."

Some few weeks ago, when addressing the shareholders of the Anglo-Persian Oil Company, I took the opportunity of indicating another factor whose growth has caused the utmost concern to those of us who are apostles of conservation and not of

waste—I mean the absolutely unlimited multiplication of facilities for the so-called "service" of the motorist. At times one begins to wonder whether there is supposed to be some obscure virtue in piling up the number of pumps, of rail and road wagons, and of service stations. If there is, I confess that all the thought I have devoted to the subject has failed to show me what it is. This is an evil with which you are doubtless familiar here, and I am not in a position to say whose form of it is the more virulent. Be that as it may, for more than one reason the time has come to call a halt. I assure you that I for one shall not rest content until we have abated the nuisance of excess, and attained to some sane equilibrium as between service and supply.

Transportation by Sea

I now approach one of the very greatest of our problems—or, rather, of our possibilities. It relates to the realm of transportation by sea. There, economies which are significant, if not vast, can undoubtedly be effected. It is a direction to which the minds of the more thoughtful among us frequently turn, and towards which, during the Great War, we were remorselessly impelled. Can it be seriously contended—if we think for a moment in terms of the world—that, as a matter of permanent procedure, American oil should find its way to India, or Persian oil to Iceland? In countless similar instances which will occur to you, you will find a clear waste of strength, a perpetual straining against the facts of geography, a lamentable lack of co-ordination. But these things happen, and must continue to happen, so long as those of us who are convinced, in theory, of the need for larger views and for world-wide surveys, find no opportunity of turning theory, by co-ordinated effort, into effectual practice; and so the world expects and condones these anomalies. In recent years many unprejudiced thinkers have reached the opinion that a better way is both possible and attainable. The subject is, of course, one which calls for the highest skill and the ripest experience to be found within the respective organizations. But, given that, I know the problem can quite definitely be solved.

I speak with all the greater confidence because I can remember so well the ingenuity and devotion that were brought to bear upon a similar task ten or eleven years ago—at a time of acutest crisis during the Great War—for achieving the greatest attainable measure of economy in the use of all the tank steamers plying the waters of the world. *Then,* so far as carriage by sea was concerned, this particular problem was absolutely solved!

I shall only touch upon a profoundly important topic to which the subject of sea-transportation naturally leads us. Even before we attain a sane "economic" of the sea, we must consider how far it might prove feasible to relate the consuming areas of the world to the respective production centers with which Nature would seem to have linked them in traceable affinity. Why should we not address ourselves to the task of finding for every market the "nearest source of supply"—that is to say, the nearest, taking account of all relevant economic considerations? If that task should prove feasible—and I, for one, do not shrink from it—and we can reconcile vested interests to take real account of it, we shall indeed deserve well of our contemporaries and do something to earn the gratitude of posterity.

Gentlemen, from what I have said you will understand that our problems outside the United States are to be found at every stage, from oil-winning, through sea-transportation—and land-distribution, until the consumer is reached. If I were asked to say which are the most vexatious, I think I would give my vote to those of sea-transport and land-service.

The Consumer

Nor do they stop at distribution. The state of mind of the consumer is an important factor. But who am I to speak of that? Gentlemen, in this particular matter the interests of the seller and of the purchaser are most certainly comparable even if they are not quite identical. That is a bold statement—one which provokes query and excites ridicule, but will, I think, sustain enquiry. Even the most elementary considerations of business prudence dictate a policy by which the interests of the consumer must in the long run be reconciled with the interests of the supplier. That is true of every commodity. It is particularly true of a commodity which in many of its grades competes with alternative commodities and within whose grades competition rages as between the lower-priced and the higher-priced. I raise that point, therefore, only in order to clear the ground by dismissing it.

I do not know whether the term "problem" correctly describes that group of complex movements having their origin in the vivid sense of nationalism which during the last ten ten years has acquired acuteness and strength in many countries. Certainly its application to many of the phenomena of industrial life produces quite a crop of problems. I may therefore say a word or two about its fundamental justification; and also about the inherent peril of over-indulgence and misapplication.

Now that oil as a bulwark of civilization is everywhere recognized, it is understandable and natural that the discovery of petroleum deposits within any country should stir the imagination of that country's citizens; and to some extent should pre-occupy their minds with the thought of the rights and advantages which such geographical custody ought to bring. Moreover, the coming of the oil era has been relatively so sudden that some disturbance of mental poise and muddling of economic thought are for a time, at any rate, to be excused, if not condoned. Or shall I say they could well be pardoned in the years when the subject of oil as a comprehensive world-influence, as distinct from oil-technology, was very scantily dealt with in works of reference or in the pages of enlightened journalism? What are the merits of this matter? Let me try to appraise them.

For a country to possess potential oil supplies of a quantity far in excess of anything its own population can ever consume, is obviously an economic fact of the utmost importance. The Great War demonstrated that it can also be a political fact of great significance—although, I confess, the more striking truth that the means of technical development, of transport, storage and organized distribution, are of still greater value seems to have escaped the attention it deserves. Anyhow, we can start by suggesting that so soon as a nation's oil resources are discovered, their forces tamed and harnessed, and the process of extraction reduced to a matter of routine, that nation is within her rights in conserving an ample measure of these resources for the greater safety of her realm.

National Security

And that brings me straight to the next point. Except in countries so equipped financially and technically as, say, the United States or Great Britain (and the title of my speech compels me to get away from the former now and then), it is always extremely difficult and often quite impossible for that minimum national security to be attained without first invoking the aid — in three dimensions, so to speak — of foreign nationals. Finance; experienced mechanical skill; and some form of adjustment to marketing conditions in relation to former imports and to possible exports—all these are essential pre-requisites. Without them the dream even of a self-supporting indigenous oil supply is vain. Why, the value of no commodity can ever be judged apart from the entire economic structure of which it is the foundation; and although the foundation-stone is important, it is not the whole building. Moreover, I am reminded of the gap that separates the value of sweet water in the Egyptian irrigation areas from, say, the value of brine in mid-Atlantic. Again, need I mention the gold that can undoubtedly be won from some of the remote mountain streams of Scotland, but remains there undisturbed because of the prohibitive cost of extraction?

I really must apologize for laboring so elementary; but I *do* want to illustrate, as simply and forcibly as I can, the fundamental fact that in a country of small consumptive power the mere possession of natural oil is of itself

an asset only in so far as a whole complex of external conditions makes it so. Without hundreds of investors willing to lose four times out of five in the hope that at the fifth they will make good their losses; without the instruction of a whole faculty of technical resource, founded and developed in other countries—or, it may be, in another hemisphere; without an army of pioneers who have adjusted the needs of man to the character of the product and *vice versa;* without a network of distributive systems having been traced upon the face of the globe —without every one of these things, the oil deposits, priceless as they are potentially, might just as well have been deeply buried in the moon.

Gentlemen, it is not for me to strike a balance as between these things. In this matter no dogma is sound, nor is it needed.

Sane Nationalism

Nevertheless, I plead, in quite general terms, for a sane nationalism: regarding oil neither as a heady intoxicant for oneself nor as a deadly drug for one's political competitors, but rather as a store of energy to be conserved, released and applied as part of a concerted operation owing its inception to more than one nation, and therefore yielding its tribute to more than one treasury.

As I have said, I think that conception of nationalism is coming; I think we have passed the peak of expropriatory legislation and of penal ordinance. But if more enlightened ideas are to become permanently established, we must all do our share towards promoting a policy of sane and honest *inter*-nationalism in industry. To sink identity and to start a communistic or syndicalistic system of oil-utilization is, however, the very last thing I would advocate. Stereotyped forms of co-operation, nationally and internationally, would be stupid, even if they were not absurd. But co-operation between national and international forces there *must* be, in some form or other, if we are not to squander the world's heritage. What we want here is something elastic, a basis of common effort that yet takes account of difference in status and difference in capacity, excluding no one merely because he is small and vilifying no one merely because he may be big.

Gentlemen, if you expected me to speak of difficult and pressing problems, I am sure you have not been altogether disappointed.

If my observations about the operation of economic law have any truth in them at all, I think no room is left for doubt as to what are the solvents of our problems—"Economic co-operation" and "the nearest source of supply." Interpret these guiding principles broadly enough, gentlemen, and our problems are gone.

There is only one place where all these problems can be assembled, comprehended, and effectively tackled—and that is round a table. Well, already some of us have sat round a table in order to discuss them, and I hope we shall do the same thing again and as often as may be necessary. But let me make it clear that that table is not a small one; nor are all its places filled.

As we approach a solution to our problems, let us never forget what we owe to the nations within whose boundaries we may be called upon to operate. Between them and us, goodwill, and nothing but goodwill, can avail us. And, I would assure you, goodwill is attainable. I think of Persia, a nation of immense antiquity and—so one might think—of obscure psychology; and I tell you it is a real pleasure to encounter the opinions and to accept the contribution to thought that the Anglo-Persian Oil Company receives continually from the enlightened representatives of that nation, a contribution which in intelligence and pertinence would stand comparison with that from any Western nation.

Gentlemen, we must go on, undeterred by calumny, unaffected by misrepresentation, fortified by goodwill. I hope you are all with me on the principle of this all-important matter. The task needs goodwill everywhere. In the East, I assure you, we are doing what we can. As showing the efforts we are making towards a solution of our own problems, I need only mention recent developments—of which doubtless you have heard—affecting India, Africa and adjacent markets.

Neither Novel Nor Obscure

If in a few words I may point out the high lights of the picture I have tried to paint, I would say this: our problems outside the United States are neither novel nor obscure. They form the complement of your own problems. They arise from the lack of invariable proximity—apparently ordained by Nature —as between the main consuming areas and the chief centres of supply, as well as the persistence with which, in the United States itself, demand forges ahead only to be overtaken by supply.

The issues can be clearly discerned. On the whole they are uncomplicated by State interference in the greater countries, or by corporate antaginism among the greater groups—or, indeed, by any need for antagonism outside them. In the countries that are potentially great in petroleum but otherwise of limited stature, we must not be surprised if understanding becomes complete only after a period of close contact and of frank revelation of aim. After all, within our own domestic boundaries, understanding was not reached in a day.

Among our problems we number many single individuals: the financier with the fever for "quick returns" and "to perdition with posterity"; the conscientious individualist whose blood pressure rockets at the "Idea of Combination," well content to condone waste, muddle and costly inefficiency if only the concern practicing these be small enough. Such men we have always with us. Happily, as we grapple with our problems, we are not without helpful allies. Within living memory, many world problems have found their solution only after the United States has lent a hand. So it must be again. And it is just at this point that it is most relevant for me to recall how powerful are the forces that the United States can bring to our aid.

Let us therefore carry on; but remembering always that the individual consumer cannot be expected to sympathize with "long views" unless it is made clear to him that they converge necessarily upon stable and rational prices. In our escape from the obsession of political boundaries, let us remember that in terms of economics, home is the first, though not always the best, market. Remembering, indeed, that for oil as a universal "element" there are no real boundaries except those that are economic, let us not rest content till we have redrawn the map of that one great oil-country—the world.

A. P. I. Makes Constructive Organization Plans

(Continued from page 43)

periods of over production and threats of undersupply without cooperation from within or control from without," Mr. Byles said. Declaring that any tariff on imported crude would be objectionable, he proposed the formation of an American export association to bring about harmonized national and international cooperation in the industry. W. G. Skelly followed Mr. Byles' paper with a talk on what standardization of equipment had meant to the oil industry, and urged that the industry in its consideration of more general problems not overlooking the tremendous value of the standardization work. Previous to the general session Tuesday afternoon, considerable time was spent in the various committee meetings where additional work has been done on the various standards for oil field equipment.

Meetings have been held also by the Division of Development and Production Engineering and a program to cover the work of this division for the coming year has been prepared and is now in the hands of the General Committee. The first group session of the Division of Development and production got under way Wednesday morning with a number of excellent papers on production and drilling problems. Further group sessions of this division will be held during the balance of the convention. Early registrations indicated a very large attendance for the meeting this year and group sessions have been well attended by representatives from practically every oil center in the country.

Tulsa.—Receipts by the Empire Pipeline Company for October, 1928, averaged 40,254 barrels daily for a total of 1,247,883 barrels. Deliveries during the period averaged 39,453 barrels or a total of 1,223,043 barrels for the month. Stocks on hand on the last day of the month amounted to 3,674,491 barrels.

Cooperation and Coordination Essential to Industry

Sound economics must be substituted for guess work, speculation and destructive competition; centralized control must be established

By AXTELL J. BYLES
Vice-President American Petroleum Institute, President Tidewater Associated Oil Company

IN the absence of E. W. Clark, president, Axtell J. Byles, vice president, opened the annual meeting of the American Petroleum Institute, held at the Stevens Hotel, Chicago, December 4, 5 and 6, with the following address:

We will assume that the following statements will be accepted as axiomatic:

1. The oil business is a basic and essential industry and petroleum and its products are indispensable to present day social and economic life.
2. While not practically susceptible to operation as a public utility business, the oil industry is nevertheless charged with a profound obligation of public service.
3. In order to render efficient service the oil business must be a profitable business. But it cannot be profitable, if it continues in alternative periods of overproduction and threats of undersupply—of feast in some of its branches and of famine in others—without co-operation from within or control from without.
4. The petroleum industry must attain rationalization.

Present Status of the Industry

Let us look at our position as we prepare to enter the year 1929. We will admit that:

Production: There is enough crude oil available to wreck the industry if produced to capacity. At the present time there is shut-in production amounting to several million barrels per day in West Texas, Venezuela, California and Wyoming, with extensive transportation facilities installed and additional lines under construction or projected. Also a material increase in production will occur in Santa Fe Springs and Seminole during the winter.

Nor should we overlook the possibility of the development of large pools in Lea County, New Mexico, where wells have been drilled several miles apart with numerous indications of oil and gas. It is not necessary to go into the detail of production by states, as the figures pertinent to this subject will be covered by other speakers in the group meetings.

Suffice it to say that with 480 million barrels of crude oil above ground, the present daily production and shut-in production, the high rate of crude oil imports, the known reserves of crude below ground, together with modern scientific methods of finding and producing oil, it is essential that the co-operative movement be strengthened and enlarged in this branch of the industry. Surely, at the present rate of production and imports, we will make large additions to our overburdened storage of crude oil from November to April, inclusive, adding to existing heavy and uneconomic carrying charges.

Manufacturing: The September, 1928, rate of gasoline supply, continued through 1929, would furnish an increase of 8.7 per cent. over the 1928 gasoline consumption, and would be greater by two million barrels than a reasonable estimate of gasoline demand in 1929. Additional refining facilities are at this time under construction, and new cracking equipment will increase the output of cracked gasoline in 1929 by over 20 per cent. Our refineries in September were running 16 per cent. above the level of throughput at that time last year, with gasoline demand but 8 per cent. larger. Additions to gasoline stocks are above normal for this time of the year, and gasoline prices are already reflecting what we have come to view with more or less complacence as a seasonal decline.

Excluding tax, gasoline prices during the past summer were approximately 99 per cent. of the pre-war level, as against approximately 150 per cent. for the average of all commodities. Such gasoline prices were certainly fair to the public, and there should be no economic reason for their declining during the winter season when operating costs increase as volume diminishes.

We have long been over-producing fuel oil, as is shown by the fact that at present there are approximately 40 million barrels of gas and fuel oil in storage east of California, and approximately 96 million barrels of heavy crude and fuel oil in California. Continuous additions to storage have weakened the price structure of this product to the point where it is now competing with the lowest types of fuel. The prices thus realized are far below economic value and seriously affect the realization from each barrel of crude oil. This automatically forces the other products of crude oil to carry an additional burden. Such a situation is the antithesis of conservation, and if continued it will prove as costly to the public in the long run as it is to the industry today.

Forecast for 1929

Let us consider crude oil and gasoline requirements for 1929. The figures given are believed to be a reasonably accurate forecast. It will be assumed that next year's gasoline demand will be approximately 408 million barrels, an increase of 8.2 per cent. over 1928. The demand can be supplied from the following sources:

	Million Bbls.
Cracked Gasoline	142
Natural Gasoline	37
Imports	10
Straight-Run Gasoline	219

To produce 219 million barrels of straight-run gasoline, with a recovery factor of 24 per cent., which we believe to be conservative, would require 914 million barrels of crude oil run to stills, or an average of 2,500,000 barrels per day. We are now producing approximately this quantity of crude oil and importing 250,000 barrels, which would indicate that our present supply is more than would be required to meet the increased gasoline demand next year.

At this point let us recall the conditions under which the industry entered the year 1926, with the production of crude oil declining. Fairly heavy drafts on crude oil stocks were taking place, with the rate of gasoline output lower than at the middle of 1925. The declining supply of both crude oil and gasoline was the result of the drastic price cuts which had taken place during the latter half of 1925. With the statistical position of the oil industry improving, sharp advances of both crude oil and gasoline prices were witnessed during the first half of 1926. These price increases acted as an immediate stimulus to supply, and crude oil production as well as the level of refinery operation began to rise, and continued on an upward trend into 1927. Attempts were made in late 1926 to check the upward trend, but the minor price declines eventuating at that time were insufficient to arrest the momentum, and the industry entered 1927 in a serious condition of overproduction. This resulted in dractic price cuts in that year, and gave rise to the prolonged depression from which the industry is now attempting to emerge.

Rationalization

The foregoing represents what I believe to be a fairly accurate statement of facts and of outlook, and makes apparent the need for rationalization. If we were to stop here, the future, near or distant, would not afford much encouragement.

Rationalism is a word easy to say, but it implies a task so complex and difficult in the oil industry as to challenge faith as well as courage. Despite all doubt of our ability to attain rationalization, such doubt is likely to turn to a determination,

to accomplish it, if we think of the situation in terms of alternatives. What of tomorrow, if through failure to stabilize by sound economic cooperation—through failure to make the sacrifices of peace—we continue the sacrifices of war? The day is past when victory can be attained in the welfare of uneconomic industrial competition, as surely as the day is past when the shock of arms leaves a real victory in the field.

Let us, therefore, at this point briefly review what has been accomplished and what further may be done for the correction of this situation.

Rationalization of Production: The necessity for taking corrective measures was made apparent by the President's creation of the Federal Oil Conservati n Board four years ago this month. Progress was very slow at first, but during the past two years a real advance has been made in the control and conservation of crude production in the States of California, Oklahoma and Texas. It would be a grave error, however, for us to believe that more than a fair start along these lines has been made. We must not overlook the futility of isolated control by local cooperation or State mandate, without coordination of the crude oil conservation movement nationally, and without cooperation with the great foreign producers of crude oil. With modern transportation facilities throughout the world, a barrel of crude oil produced any place on earth has an indirect and oftentimes a direct effect upon a barrel of crude oil produced in any other part of the world.

The petition of the producers in the State of Oklahoma to its Corporation Commission, and the latter's order thereon mark, in my opinion, the soundest and most constructive step yet taken in the conservation of crude, because the order fixes from time to time the maximum which may be produced within the borders of the State, based upon the demand for the product; provides protection for the full capacity of old and, consequently, small wells; and throws the burden upon the new and flush production where, in the public interest, it propely belongs. It is essential that these tens of thousands of small wells be kept available against a day of need, and they should be protected and conserved for the further reason that upon them depends progress in the new art of reclaiming oil left in the sands after customary producing practices are no longer profitable.

We should not overlook the progress in conservation which has been made in the State of Texas. The operators in this state have highly perfected the technique of applying control to producing leases, especially in the Yates pool. In all of this work the Texas Railroad Commission has taken a prominent part.

Cooperative efforts in restricting production of crude oil in this country cannot attain their maximum results unless similar steps are taken by the producers of foreign oil sold in competition with our domestic production. A serious situation might develop if Congress, at its coming session, were importuned to place a tariff on imported crude oil. Such action is within the realm of possibility, unless meanwhile the industry generally has become convinced that the producers of Venezuelan crude oil are making, and will continue to make diligent efforts to restrict their production in harmony with the efforts being made in this country. A tariff on petroleum is objectionable for many reasons, which we shall not here discuss, and we trust that it may be avoided.

The present crude oil reserves, and those yet to be found, instead of representing a threat will become one of the greatest stabilizing factors in the industry, provided they are properly developed, conserved and used.

Rationalization of Manufacturing: It is apparent that cooperation in the production of crude oil will avail us little if overproduction of refined products is indulged in to the extent of reducing realizations below cost levels. It is also clear that the task of curbing the output of refined products is one that must be borne by the industry generally. While the overproduction of crude petroleum is at present confined to a few states, the overproduction of refined products is more national in scope. If restriction of manufacturing be limited to a particular locality, the result will be invaded by the products of the manufacturers in other localities who are producing beyond the consumption of their local markets and dumping their products in the territory of better realizations. To accomplish the purpose of restricting the overproduction of refined products, we suggest that the industry might well form associations in each of the six or eight manufacturing districts of the country, with a view to holding production in balance with consumption within their natural transportation areas.

Rationalization of Marketing: Within the past few months the American Petroleum Institute has appointed committees which have been endeavoring to formulate a national code of ethics incident to the marketing of petroleum products. The committees are reporting to the Directors of the Institute at this meeting. The purpose of this work is to eliminate uneconomic and harmful trade practices, which, in the opinion of most of us, would be condemned by the Federal Trade Commission and by the courts as unfair competition. In the production of crude oil and the manufacture and sale of its products, it is and should be increasingly our determination to furnish the public the best products and service at the lowest price consistent with a fair over-all profit on the business transacted. No one who has given any thought whatever to the subject has any doubt that the elimination of uneconomic, destructive and sometimes unfair trade practices would result in an increased return of from one to two cents per gallon on gasoline.

This return could accrue to the oil industry without increasing the cost of the product to the consumer. Of the difficulties incident to working out marketing practices which will fit the diverse conditions of those engaged in the business, the members of these committees are fully aware, but the goal for which they are striving is of such tremendous importance that it is to be hoped that even if an agreement cannot be reached at this meeting, efforts will be continued until success is attained.

In conclusion: To sum the matter up, in order that an indispensable and irreplaceable raw material may be conserved for the benefit and protection of those who come after us, sound economics must be substituted for guess work, speculation and destructive competition. To accomplish this, there must be cooperation and coordination not only locally but nationally. A national program should be harmonized with a world program. A hope for the latter lies in the possibility of the formation of a United States Export Association, under the Webb Act, which is now under discussion, and should have the earnest support of the industry.

At this point there may come to some of us the fear that even though the industry itself were willing to enter upon a new and sound economic era in the management of its business, it would despair of the accomplishment of this purpose by reason of the Sherman and Clayton Acts, and the statutes of certain of the states. Some of us believe that great progress may be made under the laws as they now stand and have been interpreted by the courts and by the Federal Trade Commission. Some of us believe that if laws made to cope with monopolistic abuses of a generation ago prevent the nation from doing that which is for its benefits, and in accordance with the will of the people, as increasingly evidenced at the polls, these laws can and will be so amended as to permit capital, labor and the public to share in the prosperity of a new industrial and economic era. Further pleas of confession and avoidance by the oil industry will not be accepted in the court of public opinion. If we are right in what we desire to do, are frank and honest in the presentation of our problem, we may expect the cooperation and assistance of the governments, both federal and state.

The ownership of the oil business has largely passed into the hands of the public. Executives of oil companies are not different from the group of professional business managers who are running a large part of the business of America as trustees for its people. No cooperative step which might by any stretch of the imagination infringe upon the laws of the nation or any of the states should be taken without submitting it to the Federal State Commission or the attorney general's office, or both; and to the proper local commission and the attorney general's office of any state concerned.

In conclusion, I desire to express the opinion that the rationalization of this industry cannot be accomplished, no matter how much desired, without the aid of some central or overall coordinating influence. Whether this should be an individual, or a very small committee, I do not know; but I do know that it must be of a character and capacity that will command the confidence and respect not only of the divergent and conflicting interests within the industry itself, but of the government and public as well.

Production Control

By RAY M. COLLINS
Echo Oil Company

THE producers owning acreage and production in the Greater Seminole area of Oklahoma met in the Mid-Continent Oil & Gas Association's rooms, Tulsa, in the fall of 1926, and after discussing ways and means to control the flood of oil that was staring them in the face, appointed a committee and umpire to make a survey of the conditions, and report their findings, with recommendations, at a meeting to be called by the committee. From these meetings has developed the present organization and plans for the control of production in Oklahoma.

The Organization is as Follows

(1) An advisory committee, consisting of four representatives of the larger companies and three representatives of the producers not having affiliations with any pipe lines or refineries.

(2) A legal committee of five attorneys, elected by the producers who advise with the umpire, the advisory committee and the corporation commission.

(3) An umpire appointed by the producers and the corporation commission.

(4) The corporation commission of Oklahoma, and the attorney general of the state.

Mode of Operation

It is the duty of the umpire to keep informed as to general and local conditions pertaining to the production of oil and gas, and at any time in his opinion some control of production is necessary, or upon request of any operator in the field affected, he may call a meeting of all the operators interested in such area for the purpose of discussing plans and ways and means to control operations and production in said area. The producers interested are notified by phone of the intended meeting, and the newspapers carry an item giving the time, place and purpose of the meeting. The meetings are open to the newspaper men, royalty owners and any one interested in the movemnt. These meetings are conducted by the umpire who acts as chairman, and after stating the purpose of the meeting and making such recommendations as the advisory committee has passed upon, the meeting is open for general discussion. If thought advisable, a resolution is adopted and the umpire asked to petition the corporation commission for an order following along the lines of the resolution and the petition. The next step is for the attorney general of the state to join in the petition asking for the order. Then the commission sets a date for a general hearing of the petition and summons all interested parties, royalty owners, purchasing companies, pipe line companies, and producers, to appear and a record is made of the findings of the commission and if such record justifies an order the commission issues the same.

Methods Used in Production Control

(1) Wildcat wells drilled in a territory having possibilities of opening new pools are pinched in to 100 barrels per day, or, where possible, shut in completely for an indefinite time.

(2) Key wells are drilled. The term "key well" being applied to such wells as are drilled by agreements of the producers owning acreage in the vicinity of the well to be drilled, and the producer drilling the well receives a contribution equal to two-thirds the cost of a dry hole; provided, however, that it is not a paying well. In consideration of this contribution, the well drilled remains shut in or is permitted to produce 50 to 100 barrels per day until the offset wells have had time to be drilled. Key wells are drilled on short time leases, leases requiring wells on account of contracts or other obligations, and by producers wishing to test out territory. This method of testing acreage permits the producers to control the time of bringing this area into production, as well as saving thousands of dollars in the drilling of unnecessary wells and dry holes.

(3) Proration of some kind has to be adopted whenever the production becomes excessive. The usual method is to limit the production of the field to a figure equal to the transportation and marketing facilities for oil in the state. This is called "allowed production."

The field is then divided into units based on so many acres to a tract, or by leases, and the production from each lease or tract is determined by gauging the wells for so many hours or days, or is based upon the production curves. This is called "potential production."

Each unit or lease is permitted to produce such proportion of allowable production as the potential production of the unit or lease bears to the total potential of the field. This is called "allowed production of the unit or lease."

Many advocate the proration plan as adopted by the operators in Texas, which differs from the straight percentage plan, in that the potential production of the field, or unit, is determined in the usual way, but the permitted production is based upon acreage and a well average per unit.

(4) As the cost per well increases in ratio to the depths where the producing horizon is found, it seems reasonable that the spacing of wells should differ. In territory where it costs $100,000 to put a well on production, the drilling of one well, or at most two wells to a 40-acre tract should be sufficient during periods of overproduction. The Indian Territory Illuminating Oil Company and others are working on a plan of drilling one well in the center of each 40-acre tract in the area around the well being drilled by the Indian Territory Illuminating Oil Company southeast of Oklahoma City.

(5) Unitizing of acreage: In areas where the value per acre is equal, the producers owning oil and gas leases should agree to hold and own such leases in undivided interests and to develop and operate, as a unit, the entire area embraced therein. This method of controlling drilling and production has been advocated by numerous companies and has been put in operation in several places in Oklahoma and Kansas.

(6) Gas-oil ratio: Many articles have been written on this method of controlling production and conserving the gas and oil of the country, but up to the present time the producers have been unable to get together on a satisfactory plan. Differences in pressure or in the gas-oil ratio from different strata and the fact that there is insufficient data to base any calculations as to the effect on any specific wells or on a pool as a whole, makes it difficult to use any fixed plan. The producers interested in what is termed the Hunton-Misner sand pool located in Western Township 8 N, Range 5E, Seminole district, met on October 7, 1928, for the purpose of discussing the recommendations of seven production engineers on an oil-gas ratio plan for the producing of oil in that area. In their opinion such procedure would accomplish the following:

1. Produce the oil with a minimum of gas, thus secure larger ultimate recovery and maintain flowing production for the longest time possible.
2. By holding back pressure on the well it is hoped to retard the encroachment of edge water and the coming of bottom water.
3. To maintain sufficient back pressure on the traps so as to provide fuel for drilling wells and lease operations without the expense of recompressing the gas.

The recommendations specified the mode of operation and we hoped that the plan would be adopted. After considerable discussion it was decided to adjourn until the producers who were opposed to the plan could have time to consider it more fully and give the umpire time to consult with the absentee producers. The sentiment of the majority was that although the plan might not work it was an experiment that should be agreed to by all and given a fair trial. We hope to obtain

a unanimous approval before the wells are drilled in and the gas energy dissipated.

Difficulties Encountered

The movement for the conservation of oil and gas was endorsed and heartily supported by a majority of the producers, but as in all movements affecting many different companies and individuals, the actual work and responsibility was borne by a few. Consequently a great deal of the burden of evolving plans and obtaining the approval of all the parties fell upon the shoulders of the leaders in the industry, and at times they were accused, unjustly, of favoring their own companies' needs rather than that of the industry as a whole. This feeling of distrust worked a hardship on these men who gave a great deal of time and thought to the ideals of stabilization of the industry and in every case where their companies' interests were involved, they would not agree to any plan which might be construed as being favorable to them, and in many instances, they sacrificed their rights in order to hold the situation. A great deal of this distrust is due to the fact that the larger companies have interests in production, pipe lines, refineries and sales departments all over the United States and South America; whereas, a great many of the smaller companies have their entire interests in one state or one locality. The larger companies have pipe line systems running to nearly every field in Oklahoma, so that they are able to draw on all pools for their needs, while the smaller companies depend upon certain pools for their requirements, and there comes a time when these pools will not supply their demands and they have to seek other places for their supply. Therefore, we find some companies putting oil into storage at a big expense and other companies crying for oil and insisting upon drilling at a time when the industry as a whole has more than sufficient oil to supply the entire country. Then there is the natural expansion of the business, new requirements to be met, causing a drilling program for one company on a much larger scale than that of another. New companies are organized and they have to get production in order to make a showing. Others find their production declining to a point where the income barely pays expenses and when they find a lease that will make a good profit they, too, want the privilege of unrestricted drilling and production. The fear of the Sherman anti-trust act kept a few of the companies from entering into any agreements that had for its purpose the control of production. However, they did abide by any orders of the commission. Others thought that we should not appeal to the corporation commission for orders governing the actions of the producers as they felt that we were drifting towards government control, and their slogan was, "Keep the oil business out of politics."

Small units often caused the drilling of extra wells when a new field was opened to drilling.

One of the great stumbling blocks in holding back the opening of new pools was due to contract or lease obligations which required the drilling of a well within a specified time and a failure to comply with such terms meant the cancellation of the lease.

The differences of opinion among the attorneys on such questions as the powers of the corporation commission, the rights of the royalty owners to force the drilling of a well offsetting a pinched in well, or to compel the producer owning the shut-in well to open it to full production, are continually coming before the legal committee. These questions involving the rights of the lessees and lessors are serious ones, as in many cases cancellation and damage suits are threatened, and some companies rather than fight a suit, the loss of which might amount to around one million dollars, prefers to violate the orders of the corporation commission.

Results

The peak for the Greater Seminole area was reached July 30, 1927, with a daily production of 529,596 barrels from 666 wells, at which time it was found necessary for the corporation commission to issue an order whereby the production in this area was limited to 450,000 barrels per day. Proration of production, restricting the shooting of wells and controlling the drilling of wells in the outside areas of the pools was put into effect on August 7, 1927, and resulted in the controlling of the production to the figures as set by the order of the corporation commission. The greatest results of the conservation movement in Oklahoma were attained, not through proration, but by agreements of producers to shut in producing wells, or wells that looked as though they were on geological highs with great possibilities of opening new pools at a time when a new flush pool would have spelled disaster to the industry. It is impossible to understand the benefits derived from the shutting in of these wells without going into the history of each case and then summarizing the facts and drawing conclusions. The following paragraph was embodied in all agreements made by the producers and in the orders of the corporation commission:

"During the period this order remains in force, and to prevent further and additional waste in said Seminole area, the following wells therein, to-wit: Barnsdall Oil Company located in Section 22, Twp. 7N. Range 6E,; Gypsy Oil Company located in Section 33, Twp. 8N. Range 6E.; Indian Territory Illuminating Oil Company located in Section 16, Twp. 8N., Range 5E.; Gypsy Oil Company, located in Section 5, Twp. 8N. Range 6E.; Prairie Oil & Gas Company located in Section 24, Twp. 9N. Range 5E.; Gypsy Oil Company located in Section 7, Twp. 8N. Range 6E.; Barnsdall Oil Company located in Section 14, Twp. 8N. Range 5E.; Independent Oil & Gas Company located in Section 23, Twp. 7N. Range 6E.; Snowden & McSweeney located in Section 13, Twp. 7N. Range 6E.; Mid-Continent Petroleum Corporation located in Section 5, Twp. 7N. Range 7E., shall be, by the owners thereof, held in the same condition respecting production as existed on the date of this order, and during this period no operators drilling wells in the zone surrounding said five wells, shall do anything in connection with their wells to prejudice the rights and interests of the owners of said five wells who by virtue thereof are required to hold the same in status quo. The commission reserves the right to make any auxiliary order necessary to carry the provision of this paragraph into effect"

Following is the history of the shut-in wells:

(1) Gypsy No. 1 Margay-Brown, Section 33, Twp. 8N., Range 6E., completed May 1, 1927. Initial production 1032 barrels. Pinched May 9, 1927, to 100 barrels, later to 50 barrels. Opened and drilled one foot on July 12, 1928, with production of 1580 barrels. This area has since proved to be small in extent and in production as one of the offsets and two wells drilled to the southwest were completed for dry holes in October and November, 1928. The production in this area may never exceed 10,000 barrels.

(2) Gypsy No. 1 Mission, Section 5, Twp. 8N., Range 6E. Drilling was suspended on this well July 4, 1927. Recommenced June 3, 1928, and completed June 11, 1928, with an initial production of 3210 barrels. Fourteen wells have been drilled in this area since July 4, 1927; four being dry and 10 producing wells with initial production of 200 to 4500 barrels. The Bessie Doser No. 1 (Gypsy Oil Company) is the only well in this field to receive discovery rights, the others being drilled as key wells. The producers owning acreage in this area agreed to the following arrangement for the further development of this pool:

"(a) Two wells may be drilled upon each 40-acre tract in the area defined at the locations shown on the plat of the Seminole umpire. Such wells may be spudded November 15, 1928, and placed upon production February 15, 1929.

"(b) All wells which have been completed or which are now drilling, upon which the discovery rights have been waived, may be opened for production on February 15, 1929; provided, however, that the Seminole Umpire may permit production not exceeding 50 barrels per day on all leases which may expire prior to February 15, 1929.

"(c) Any and all additional wells which may be drilled in this area may be spudded January 1, 1929.

"(d) No well in the area shall be shot without permission of the Seminole Umpire."

It is estimated that 75 wells will be opened for full production on February 15, 1929, with a probable total initial production of about 100,000 barrels. Without drilling restrictions this 100,000 barrels of flush production would have been thrown

on the market in November and December 1927.

(3) Barnsdall Oil Company No. 1 Fife, Section 14, Twp. 8, Range 5E., completed December 10, 1927. Initial production 1396 barrels. Shut in December 15, 1927. Later produced 50 to 100 barrels per day. Production, when opened on October 14, 1928, was 1270 barrels. Restrictions on drilling and production were removed on October 14, 1928, due to royalty owners forcing the drilling of an offset well. At the present time there are 13 wells drilling and 8 locations made in this area. The size of the pool as to productive acreage and amount of production is very problematical, therefore it is impossible to make any estimate as to the amount of oil that would have been produced from this area in March and April, 1928.

(4) Barnsdall Oil Company No. 1 Hotulke, Section 22, Twp. 7N., Range 6E. Drilling was suspended on this well May 1, 1927. Completed February 7, 1928. Initial production 70 barrels.

(5) Snowden & McSweeney No. 1 Tiger, Section 13, Twp. 7N., Range 6E. Completed December 10, 1927. Initial production 1500 barrels. Pinched to 100 barrels per day and opened for production June 15, 1928.

(6) Independent Oil & Gas Company No. 1 Harris, Section 23, Twp. 7N., Range 6E. Completed November 5, 1927. Initial production 2500 barrels. Pinched to 100 barrels. Opened for production June 15, 1928.

Twelve key wells were drilled between January 1, 1928, and June 15, 1928, four being dry and eight producing wells with potential production of 1500 to 8000 barrels. The producers agreed to the starting of 79 wells as of June 15, 1928, and later on the drilling restrictions were removed. Production was restricted to 1600 barrels per day to the 40 acres to September 10, 1928, at which time an order was issued by the corporation commission limiting the maximum production from the state to 700,000 barrels. Provided, the corporation commission reserved the power on the first of each month to increase or reduce the total quantity of oil which might be produced in the state, such determination by the commission to be based upon the relationship between production and demand in the state, and whether or not the production of oil in the state at the time, unless restrained, would be in excess of the transportation and marketing facilities for oil in the state. On October 1, 1928, it was found that at least three of the purchasing companies purchasing the oil in the state would be able to purchase and run increased amounts of oil and that the reasonable market demand, transportation and marketing facilities for crude oil approximated 750,000 barrels per day. Therefore, the order of September 10 was modified to the extent of increasing the maximum quantity of crude oil to be produced to 750,000 barrels per day. The peak of new production from this area (wells 4-5-6) was 100,000 barrels as of October 11, 1928. Restrictions on shooting are still enforced on this and the St. Louis areas. Without restrictions, this production would have been thrown on the market in February, March and April, 1928.

(7) The Mid-Continent Petroleum Corporation—No. 1 Smith in Section 5, Twp. 7N., Range 7E. Completed November 7, 1927. Initial production 1000 barrels. Shut in on Wilcox sand. Produced 50 to 100 barrels per day, between casings, from Simpson sand. Opened for full production September 20, 1928. Production 1000 barrels, increased with deeper drilling to 3500 barrels. Restrictions on drilling and production were removed September 20, 1928. No new wells have been drilled in, so that the extent of the field and the amount of production to be expected is unknown. Without restrictions, this pool would have been at its peak of production in February, March and April, 1928.

(8) Magnolia Petroleum Corporation —No. 1 Fyke—Section 19, Twp. 7N., Range 5E. Suspended drilling April 19, 1927. Production 100 barrels. Recommenced drilling June 14, 1928. Completed July 14, 1928. Production 8970 barrels per day. This well opened the St. Louis pool in the Wilcox sand. The pool has been producing from 80,000 to 90,000 barrels a day since September 1, 1928. Unrestricted, a peak production would have been developed in September and October, 1927.

Controlling of production by restricting of shooting, drilling of wells, and proration effected a levelling of the production curve during the last half of 1927 and all of 1928 to a point where the transportation and marketing facilities for crude oil were fairly well balanced. Without this control, a peak production of better than 600,000 barrels per day for the Greater Seminole area would have been attained in 1927, and between 50,000,000 and 60,000,000 barrels of additional oil placed in storage during 1927 and 1928. The price of crude oil would have been reduced to a figure where thousands of small wells could not have made expenses, thus causing a great many producers who would not have had the finances to weather the storm to abandon many small properties. Large quantities of crude oil would have been used for fuel oil. Gasoline would have been manu-

PRODUCTION STATISTICS FOR OKLAHOMA

Production in Thousands of Barrels	1925	1926	1927	1928
Flush, Drilled in During Year	60,000	67,000	155,000	90,000
Settled (Prior Years)	107,901	110,651	121,022	151,000
Total	167,901	177,651	276,022	241,000
Wells				
Flush (Drilled During Year)	2,929	3,119	2,365	1,825
Settled (Prior and Producing)	57,346	57,331	58,525	59,390
Total	60,275	60,450	60,900	61,215
Average Production per Well 1 Year				
Flush	20,000	21,500	65,500	49,300
Settled	1,880	1,930	2,060	2,540
All Wells	2,790	2,935	4,530	3,940
Average Initial Production per Well	300	316	775	850
Average Production per Well per Day				
Flush	55	59	179	135
Settled	2.5	5.3	5.5	7
All Wells	7.6	8.	12.4	10.8

Compiled by W. H. Collins.

PRODUCTION STATISTICS FOR OKLAHOMA

Production in Thousands of Barrels Per Year

	Prior 1925	1925	1926	1927	1928	Total	Producing Wells Drilled	Wells Producing 1928
Prior 1925	1,691,563	....	....	....	....	1,691,563	85,209	52,565
1925	108,050	59,851	....	....	....	167,901	2,929	2,200
1926	84,651	26,000	67,000	....	....	177,651	3,119	2,600
1927	72,022	17,000	32,000	155,000	....	276,022	2,365	2,100
1928*	62,000	12,000	19,000	60,000	90,000	241,000	1,825	1,825
Total	2,023,276	114,851	118,000	215,000	90,000	2,554,137		61,215
Average Ultimate per Well	27,000	57,000	65,000	145,000	140,000			
Average Initial per Well	150	300	316	775	850			
Estimate of 1929 without New Wells	53,000	9,000	14,000	35,000	40,000	151,000		

*November and December Estimated.
Compiled by W. H. Collins.

factured by the "straight run process," rather than by the "cracking process." Millions of dollars would have been lost by the industry, while the public would have benefited to a very small extent during the overproduction period. If we are to think of the future, to protect our natural recources for future generations, we must control our production of today and tomorrow.

Prospects for 1929

Production in Oklahoma on January 1, 1928, was 675,000 barrels. Stocks of all crude oil in Oklahoma and Kansas amounted to 131,000,770 barrels. The estimated production for 1928, from wells on production as of January 1, 1928, amounted to 153,000,000 barrels. On January 1, 1928, the shut-in wells and prospective territory was as follows:

South Little River Pool.

Mission Pool.

St. Louis Pool.

Areas around the Barnsdall well in Section 14-8-5.

Gypsy Oil & Gas Company well in Section 33-8-6.

Mid-Continent well in Section 5-7-7.

Prairie Oil & Gas Company well in Section 24-9-5.

Extensions of the Greater Seminole pools.

Of this territory, South Little River, St. Louis pool and the areas around the Gypsy Oil Company well in Section 33-8-6 and the extensions to the Greater Seminole pools have been drilled and the production absorbed by the purchasing companies.

Estimated production for January 1, 1929, is 700,000 barrels. Stocks of all crude oil in Oklahoma and Kansas estimated at 131,000,000 barrels. The estimated production for 1929, from wells on production, as of January 1, 1928, amounts to 151,000,000 barrels. Shut-in and prospective territory as follows:

Allen Pool—Wilcox sand.

Mission Pool.

Western Township 8n, Range 5e.

Areas around the Barnsdall Oil Company well in Section 14-8-5.

Mid-Continent well in 5-7-7.

Prairie Oil & Gas Company well in 24-9-5.

Extensions to the St. Louis Pool.

Production from new wells in Oklahoma amounted to 39 per cent. of the total production in 1922, 35 per cent. in 1923, 45 per cent. in 1924, and 35 per cent. in 1925, 37 per cent. in 1926, 56 per cent. in 1927, and 37 per cent. in 1928. If the ratio of flush and settled production continues at the same ratio as it has in the past, Oklahoma will need 90,000,000 barrels of new production in 1929. What Oklahoma and Kansas will do in the way of new production for the year 1929 is any one's guess, but it is reasonable to surmise that the production will at least equal that of 1928, and with higher prices for crude oil, the figure may even exceed the estimates of 1928. From past records and present data, plus new methods for the finding and producing of crude oil, it seems just as essential for the producers to co-operate in the controlling of production of the future as it was in 1927 and 1928.

Production Curtailment in Texas

By J. ELMER THOMAS
Fenner and Beane

SIX years ago the average oil man did not believe West Texas could produce any oil; today the average oil man does not believe West Texas could produce the oil its wells gauge. Six years ago we were producing and consuming 1,900,000 barrels per day, with less than 400,000,000 barrels in storage; today we are producing and consuming 2,800,000 barrels per day with more than 600,000,000 barrels in storage. Six years ago we were wondering where we could discover supplies for the next year's consumption; today we are wondering how we can consume last year's discoveries. Thus do the fashions change in the oil industry.

Shortly after the threat of Seminole was indicated in 1926, the extensive reserves in the Texas Panhandle and in the West Texas Permian Basin became apparent to all. Pipe line outlets were lacking and an unsaturated market was still more conspicuously absent. Drilling depths were moderate, development costs were reasonable and production expense small. An enormous amount of low cost oil could have been dumped on the market at cheap levels. Was Texas to sell off its "one time crop" at bankrupt prices? Or were the new economics, "supply at a price," to prevail? Curtailment was the order of the day.

The coincidence of three new and important oil producing districts being discovered almost simultaneously was more than the industry had expected. Desperate illnesses require desperate remedies. The outstanding point in the history of last year's producing activities is that so little hardship has been worked upon any one operator. This is a tribute to the general appreciation of the situation and a recognition of solidarity within the industry.

Restraint of production may be arranged and has been practiced in various ways:

(1) The complete shutting-in of an entire developed field as was done in the case of West Coyote Hills, California, in 1923;

(2) The proportionate pinching in of all wells in a field to a stated per cent. of their open flow potential, of which an example would be Signal Hill, California, in July, 1923;

(3) The pinching in of producing wells to an allowed outlet based on the amount of proven acreage owned by the respective operators, as was done in the Yates pool, Texas, the first half of 1928;

(4) The pinching in of producing wells in accordance with some formula of potential gauges and proven acreage as now practiced in the Hendricks pool, Texas;

(5) The shutting in of all production from a deeper horizon, as has been practiced at Salt Creek, Wyoming.

Restraint of development is a preliminary form and possibly a more effective method of curtailing production, and it can be practiced in several ways:

(1) By deferring any test on acreage which might prove to be an immediate source of flush production. There are always many examples of this during any period of over-production;

(2) By pooling acreage to permit joint operations, where lease terms compel the development of subdivided leaseholds. This frequently can be done in advance of drilling, as in numerous examples recently in Texas and Oklahoma;

(3) Shutting in any new discovery well to a nominal amount, possibly paying royalty on adjacent tracts if lease conditions required offset wells;

(4) Starting several tests, known as "allowed key wells," around a new discovery to establish the production limits of a pool. This practice has been followed frequently in the Seminole district.

Other restrictions may in effect reduce the amount of flush production thrown on the market. One consists in the proration of runs from a lease where the production itself is not restricted if the surplus is to be stored. Another occurs where all production will be run but only part of it paid for. All of these methods on oc-

casion have been practiced in Texas during the past. The methods now in use, and the causes and results of their adoption, will be discussed in detail.

The Yates Pool

The first difficult situation confronting us in Texas was the Yates pool in Pecos County. As early as the summer of 1927 it became known that wells producing as much as 6000 barrels of black sulfur oil at 1000 feet in depth could be drilled in a few days. For this oil there was little market and less outlet. Structural conditions indicated a very large productive area, judged by previous standards. Leaseholds were principally in section units and owned by large companies. An agreement to produce those wells ratably, to pinch in their production to the available outlet, and to avoid erecting extensive storage, was reached readily.

The first method agreed upon represented proration in its most primitive form. The pipe line outlet was apportioned to each individual well in that ratio which its gauge bore to the total gauges of all wells in the field. This method, known as the "potential production plan," was adopted by a committee of operators and was in effect from October, 1927, to January, 1928. The relative production of any well was computed upon the basis of a one hour gauge, there being no storage in the field for longer production tests, and this method has persisted ever since.

The potential basis of proration inevitably led to excessive drilling, considering the restricted outlet. Any company desiring to increase its share of pipe line space had only to drill aggressively and reach a disproportionate percentage of the total developed potential. Furthermore, there was a natural tendency to locate wells in areas of good porosity to build up gauges at the expense of correct spacing which would distribute properly the wells reducing the pressure.

Effective January 1, 1928, the method of proration was changed to a "proven acreage" basis. Under that plan the area proven by producing wells was determined monthly and each company was apportioned that percentage of the pipe line space which its proven acreage bore to the whole. Under this plan there was no advantage in drilling additional wells unless a company could increase its share of the proven acreage. Many wells were drilled but the area originally designated was reduced and not extended.

Properly administered, this plan would have been fair and reasonable, but the pipe line outlet earned by some proven sections was utilized by other developed sections under the same ownership and withdrawals along competitive lease lines were unbalanced. Theoretically there should have been no necessity to balance such takings, but the attempt was made and interior wells were drilled to supply alloted surpluses. The greatest dissatisfaction, however, was occasioned by the large disparity in the relative productivity of different areas. While it proved impossible to zone the acreage it soon became evident that, acre for acre, all parts of the structure were not equally productive and this led to a second change in the basis of proration.

The third and present method was adopted by the operators after a careful study and extensive discussion. It was held that the only equitable, permanent arrangement should cause a logical development of the whole productive area and led to equable withdrawals from all over the field. It was postulated that ideal proration would affect only the time element, that ultimate production should be the same as if the field had been developed in the normal customary manner.

This introduced such practical considerations as (1) the physical impossibility of any operator, however strong, being in a position to care for or move away such enormous production as indicated by potential gauges in the Yates pool; (2) the patent ability of the owner of a small production on the edge of a pool to produce and move his entire production; (3) the presumption that ultimate yields were not in direct ratio to initial gauges; (4) that with production restrained edge wells would probably be longer lived than if flush oil in the heart of the field were moved rapidly; and (5) with allowed production only a small per cent. of potential, many wells would be held below a production that would meet expenses, although they were capable of being operated at a profit.

A full consideration of all these facts led to the adoption of a combination acreage and potential basis of prorating. One-fourth of the pipe line space was allotted to acreage in 100-acre units and three-fourths of the pipe line space was apportioned to production in the ratio that the potential production, average by 100-acre tract, bore to the total of such everaged potentials. It was further considered to use, not the full potential gauges, but instead their square roots, to provide mathematically for a geometrical reduction of the very large gauges as compared with the small or moderate gauges, but this suggestion was not adopted.

After the committee of operators had agreed upon this method the Texas Railroad Commission promulgated an order putting it into effect. Some objections to it have been raised but it appears to be the best form of proration in the United States today. No better method has been proposed so far and it promises to remain in effect, possibly with some slight further

YATES POOL PRODUCTION STATISTICS

Period	Number of Prod Wells	Number of Prod. 100 Acre Units	Number of Proven Acres	Number of Proven Acres per Well	Total Potential Gauge	Daily Allowed Output	Output in % of Potential	Outlet in Bbl. per Well	Outlet in Bbl. per Acre	Monthly Pipe Line Shipments	Cumulative Pipe Line Shipments	Cumulative Prod. per Well	Cumulative Prod. per Acre
Oct. 1, 1927	23				172,845	30,000	17.3%	1,304		914,492	914,492	39,760	
Nov. 1,	40				313,301	37,000	11.81	925		1,207,721	2,122,213	53,055	
Dec. 1,	71		15,113	212.9	604,974	42,000	6.94	591	2.77	1,608,827	3,731,040	52,549	
Jan. 1, 1928			15,113			48,000			3.17	1,486,435	5,217,475		
Feb.			14,259			48,000			3.36	1,401,699	6,619,174		
March			14,673			48,000			3.27	1,493,139	8,112,313		
April			14,120			48,000			3.39	1,552,013	9,664,326		
May			14,120			52,500			3.72	1,443,509	11,107,835		
June			14,120			52,500	2.92		3.72	1,461,326	12,569,161		
July 1-15	206	100	10,000	48.5	2,575,047	65,000	2.52	315	5.10	1,985,400	14,554,561	70,653	1,347
16-31	222	108.5	10.850	48.9	2.819.237	65,000	2.3	293	5.19				
Aug. 1-15	243	127.5	12,750	52.5	3,012,925	65,000	2.1	266	5.09	2,171,168	16,725,729	68,830	1,291
16-31	245	129.5	12,950	52.85	3,196,239	65,000	2.0	263	5.02				
Sept. 1-15	248	130.5	13,050	52.7	3,425,923	72,500	2.2	290	5.55	2,132,234	18,857,963	72,810	1,352
16-30	259	139.5	13.950	53.9	3,835,651	72,500	1.8	277	5.19				
Oct. 1-15	262	142.5	14,250	54.4	4,008,075	72,500	1.8	276	5.08	2,341,320	21,199,283	78,226	1,419
16-31	271	149.8	14,950	55.1	4,049 305	72,500	1.79	267	4.85				
Nov. 1	274	150.5	15,050	54.9	4,166,917	72,500	1.74	264	4.82				
Total Nov. 1	274	150.5	15,050	54.0	4,166,917	72,500	1.74	264	4.82	2,175,000	21,199,283	78,226	1,419

modifications as allowances of more additional wells fall below economic limits.

Hendricks Pool

Proration in the Hendricks pool was not inaugurated until nearly two years after its discovery, by which time about 185,000 barrels daily of pipe line capacity was under construction, principally to loading racks or tank farms. Production was well below the limit of these facilities when proration was first discussed, but by the time it was put into effect it was nearly double that amount.

It soon appeared that the "outlet" was actually in excess of the "market" or consumptive demand, and there have always been idle transportation facilities from the field. On the other hand, there is a large amount of filled and some empty storage in that area, in part built to care for production before the trunk pipe lines were completed and in part built to take care of temporary flush production.

The method of proration used in Winkler County since May 5, 1928, combines the acreage and potential but in a way much different from the used in the Yates pool. Half of the pipe line space is allotted to acreage based on developed 40-acre units instead of 100-acre units and half is apportioned to potential production in the ratio that the *total*, instead of *average*, indicated gauges on a unit bear to the grand total of potential gauges. Leaseholds are so dissected in the Hendrick pool that the 40-acre unit was preferred to the larger acreage unit and, while this called for much additional drilling, one well to prove up any 40-acre unit was not an excessive requirement.

The use of total potential gauges, instead of average potential gauges, however, has worked a real hardship on the operators and it would seem that the Railroad Commission should have recognized the superiority of the Yates pool plan. Even if consistency in the regulations had no merit, the adoption of gauges averaged by units would have saved at this time an enormous amount of unnecessary drilling which not only caused an undeniable "waste of industrial facilities" but also built up an increasingly excessive over-production.

As of November 1, 1928, there were 179 proven 40-acre units developed by 394 producing wells with an additional 92 drilling wells. If the potential of any unit were to be figured from one well, or from an average of all the wells on that forty, there would not be the present premium placed on promptly drilling all locations. If any unusually light well were to be completed on a tract under the Yates plan the owner at his option could drill one or more wells to attempt to raise the average, and the average would be properly the measure of the productivity of that tract as against the productivity of an adjoining tract as measured by one or several wells. Under the Winkler plan, on the other hand, the owners of all adjacent tracts and also nearby tracts, in an ever widening circle, are compelled to drill additional wells to equalize drainage and without any prospects of an increased income from that additional expenditure.

It has been argued that if the Yates plan had been applied to the Winkler area at the beginning of proration a hardship would have been worked upon those operators who had developed aggressively so that two or three or four wells per forty were already completing. Viewed from another angle, the plan as adopted worked a hardship on those operators who had refrained from active drilling because the outlet and market was so far below the field's potential. Clearly the best interests of the industry were better served by the latter group.

The present spectacle of an order to restrain production which at the same time forces unnecessary drilling is an anomaly that calls for correction. If the situation in the Hendrick pool has progressed too far to permit a change there, surely these regulations which also cover the Leck area, seven miles north, and the O'Brien area, five miles south, should be changed in so far as those areas are concerned, whether or not they ultimately prove to be connected with the present Hendricks pool.

The allowed outlet assigned to the Yates and Hendricks fields was originally determined in accordance with the current demand for that crude, the principle applied being to produce only such oil as would be purchased and moved away, so that no oil, gas, or industrial facilities would be wasted. The two pools are comparable in area, initial production and ultimate yields and yet the market for the Yates pool originally was only 17 per cent. of the market in the Hendricks pool. This worked a considerable hardship on the operators in the Yates pool who desired an immediate income from their large oil reserves, although no abstract principles of conservation were violated.

On the other hand, the allowed outlet for the Hendricks pool, as it affected the back-pressures carried on the wells, was a matter of much concern in the case of

HENDRICKS POOL PRODUCTION STATISTICS

Period	Number of Prod. Wells	Number of Prod. 40 Acre Units	Number of Proven Acres	Number of Proven Acres per Well	Total Potential Gauge	Daily Allowed Output	Output in % of Potential	Potential in Bbl. per Well	Outlet in Bbl. per Well	Potential in Bbl. per Acre	Outlet in Bbl. per Acre	Monthly Pipe Line Shipments	Cumulative Pipe Line Shipments	Cumulative Prod. per Well	Cumulative Prod. per Acre
Total to Aug. 31, 1927	7			10								256,550	256,550	36,650	3,665
Sept. 1-30	8			10					1,057		106	253,745	510,295	63,787	6,378
Oct. 1-31	12			10					1,082		108	402,598	912,893	76,073	7,607
Nov. 1-30	33			10					855		86	847,079	1,759,972	53,333	5,333
Dec. 1-31	39			10					1,302		130	1,573,825	3,333,797	85,842	8,584
Jan. 1-31	64			10					1,290		129	2,561,092	5,894,989	92,109	9,211
Feb. 1-29	86			10					1,402		140	3,497,794	9,392,783	109,214	10,921
Mar. 1-31	121			10					1,459		146	5,475,367	14,868,150	122,879	12,288
April 1-30	153			10					1,439		144	6,607,791	21,476,141	140,371	14,037
May 1-5												1,137,447	22,613,588		
5-15	164	79	3160	19.27	521,579	150,000	28.76	3,180	918	165	47	1,650,000	24,263,588	148,314	7,678
15-31	171	82	3280	19.18	643,973	150,000	23.28	3,766	877	190	46	2,400,000	26,663,588	155,927	8,129
June 1-15	187	93	3720	19.89	839,786	150,000	17.86	4,491	802	225	40	2,250,000	28,913,588	154,619	7,772
16-31	209	105	4200	20.10	1,060,083	175,000	16.51	5,072	837	252	42	2,800,000	31,538,588	150,902	7,508
July 1-15	224	114	4560	20.36	1,242,348	175,000	14.09	5,546	781	272	38	2,625,000	34,163,588	152,516	7,492
16-31	260	128	5120	19.67	1,376,861	175,000	12.71	5,296	673	269	34	2,800,000	36,963,588	142,167	7,219
Aug. 1-15	288	137	5480	19.03	1,808,076	175,000	9.68	6,278	607	330	32	2,625,000	39,588,588	137,457	7,224
16-31	312	148	5920	18.97	2,087,548	175,000	8.38	6,691	569	352	29	2,800,000	42,388,588	135,861	7,160
Sept. 1-15	330	152	6080	18.42	2,294,671	175,000	7.63	6,954	530	377	28	2,625,000	45,013,588	136,405	7,403
16-30	350	161	6440	18.40	2,505,902	175,000	6.94	7,160	500	389	27	2,625,000	47,638,588	136,110	7,397
Oct. 1-15	363	168	6720	17.94	2,496,491	150,000	6.01	6,877	413	371	22	2,250,000	49,888,588	137,434	7,424
16-31	380	174	6960	18.32	2,798,134	150,000	5.30	7,363	395	402	22	2,400,000	52,288,588	137,601	7,512
Nov. 1-15	394	179	7160	18.17	2,771,848	150,000	5.41	7,035	380	385	21				
Total to Nov 1, 1928	394	179	7160	18.17	2,771,848	150,000	5.41	7,035	380	385	21	.....	52,288,588	137,601	7,512

such wells as made large amounts of water. The petroleum engineers working in that field can show that the proper amount of pressure to carry on such a well is an individual problem and the evidence indicates that further increases in back pressure beyond the point of greatest efficiency results in an increase in the amount of water and decrease in the amount of oil produced from such wells. While the data is not yet completely conclusive, there is a growing belief that the curtailment in outlet on October 1, 1928, was harmful, taking the field as a whole.

Even if this belief were generally accepted, there might remain some hesitation over increasing the allowed outlet if that entailed building storage for a surplus over current purchases. The foundation of all proration is conservation and it may be necessary to choose between two evils. Co-operation between the operators and the Railroad Commission, however, may develop a plan to shift part of the present market to such wells as should have an additional outlet. This is a good example of the increasing complications which confront curtailment in Texas and the industry will be interested in awaiting the solution of such problems.

Production statistics on the Hendrick pool to November 1, 1928, are given in the accompanying table.

Roberts-Settles Pool

The latest area to require proration is the Roberts-Settles area in Howard and Glasscock Counties. Close to the light production from shallow sands in the Chalk field some very large wells have been obtained in the same Big Lime as the Yates and Hendricks fields. Gas volumes are smaller, pressures are less, and conditions of porosity still more erratic, so that while the productive area may be large a potential production comparable to those other pools is not in prospect. Here we have production from several horizons sufficiently separated to permit zoning. This has made possible an improved basis of proration.

As in the Hendricks pool, the unit tract is 40 acres. As in the Yates pool, the potential of only one well per unit is used, but here only one test per unit is permitted to any one productive horizon, and a test may be drilled on each tract to each pay zone. Such a definition of producing horizons is not possible at Yates or Hendricks.

All pipe line space is apportioned between the three present producing horizons in the ratio that the total of potential gauges for wells in each zone bears to the total for all wells, and in the group of wells for each horizon its allowed production is distributed in the proportion that each well's gauge bears to the total gauge of wells in that horizon. Where offset wells produce from the same horizons this is a fair provision against undue drainage, but where offset wells produce from different horizons, with the probability that such distinct zones of porosity are in fact connected, the arrangement is open to some question. It is still too early in the life of the field to determine whether these provisions will lead to excessive drilling, but the present restricted market in this area, 25,000 barrels, lends slight encouragement to anything other than defensive drilling.

An important problem has already arisen because of the completion of a new wildcat well which is three miles west of the developed area of the Roberts pool and which shows a larger production and better oil than the average well in the Roberts pool. Application has been made and granted to segregate the new Settles area from the proration order and it was allowed an outlet computed separately. What will be done when additional wells are completed in that vicinity has been held in abeyance. This is a good example of the increasing complications which confront curtailment in Texas.

The Salt Dome Area

Drilling restraint has also been practiced in other parts of Texas. The Panhandle has large proven areas where development has been deferred during this depression. Some drilling has been held back in Wilbarger County, where production is high grade light gravity crude. The largest indicated, unexploited supply is represented by the salt domes in the Gulf Coast of Texas and Louisiana.

Due to the rapid expansion of geophysical exploration, the rate of discovery of these hidden structures has been accelerated. From 1901 to 1924 a total of 63 salt domes were found and 21 oil fields were developed. From 1924 to 1928 between 50 and 60 salt domes have been detected, many of which have been drilled and some of them already proven. In a few cases very large wells have been obtained and important reserves indicated. In view of the large percentage of known domes which thus far have proven productive, and with the additional fact that frequently it requires numerous tests to develop the production, so that a still larger percentage ultimately may furnish oil fields, it is a safe assumption that in the aggregate a very considerable oil supply may be relied upon from this source.

Not all of this crude will be heavy oil. The Boggy Creek field in Cherokee County is 39 gravity crude with a refinery cut superior to Mexia or Powell. Other interior salt domes may furnish comparable crude, and perhaps eight or 10 of them are under lease. For the most part these salt domes are leased by one or by very few companies. Aggressive, competitive drilling will rarely result, but because of diverse fee ownership, test wells must be drilled and, if successful, development programs must be launched well before the expiration of the average short term leases. Long before the large reserves of West Texas have been matrially depleted important production from East and South Texas may be seeking a market.

The Present Situation in Texas

The operators in Texas believe that they are curtailing production in good faith. They do not urge that the one hour gauges of the pinched-in wells in West Texas represent a potential production which could be maintained for long. No more do any initial productions of shut-in wells from any producing horizon, sand or lime, indicate a daily production that would hold up for many months or even weeks.

Large productive areas with numerous producing horizons and highly porous reservoirs do indicate a very large oil reserve. Drilling depths are moderate, development costs are reasonable and production expenses are low. An enormous amount of flush oil can be made available promptly at cheap prices. The short history of the Hendricks pool and the longer record of comparable wells in the Mexican fields indicate that large production can be maintained from these limestone reservoirs long after water makes its appearance.

There is a sound line of reasoning which would tend to suggest that the very large wells with a high gas-oil ratio indicate a smaller potential daily production than the wells are capable of making. In the Hendricks pool where pipe lines and storage were available many wells were gauged for 12 and even 24 hours before their flow was restricted. In numerous cases with a high gas-oil ratio it was found that the oil production the third, fourth, fifth, and subsequent hours increased over the gauge given for the first hour. As the gas declined a materially larger amount of oil was produced. It seems probable that the same thing would be true for many of the very large wells in the Yates pool and that this increase in potential production over the gauges indicated by the first hour would, in the case of the very large wells, more than offset the false gauges furnished by a few small wells which can be opened up to flow for one hour at a better rates than they are capable of producing daily.

Quite apart from this question of daily flow the average production per acre to date is very interesting and affords some important evidence relating to the ultimate yield, which after all is the important factor. In the Yates pool, assuming 10 acres to the well and with a productive life averaging less than six months, 7600 barrels per acre have been produced to date. There is virtually no diminution in pressure and no important amounts of water except around the edge of the field. The Hendricks pool, figured on the same basis, has already produced an average of 12,200 barrels per acre, in spite of the large amounts of water which appeared early in the life of the field. In the Yates pool there is a decided possibility that lower productive horizons will be encountered and in the Hendricks pool these have already been disclosed by a few tests. Taking all these factors into consideration, an ultimate yield for the entire productive area of from 20,000 to 50,000 barrels per acre is highly probable and an average of 30,000 barrels per acre is certainly a reasonable estimate. The limits of neither

(Continued on page 86)

Production in the Rocky Mountain Area

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THE so-called Rocky Mountain States—Montana, Wyoming, Idaho, Utah, Colorado, New Mexico and sometimes Arizona—cover about 25 per cent. of the area of continental United States, and contain about two per cent. of the population. This disproportion of area to population has had its significance from the standpoint of the petroleum industry. Due to the absence for a number of years when the production of crude oil in the Rocky Mountain area was at its peak, of any pipe line connections with the more populous centers to the east and west, the crude oil problem in the Rocky Mountain States might have been called one of underconsumption quite as properly as that of overproduction. For many years there was a differential of from 25 cents to 45 cents per barrel against the field price of Rocky Mountain crudes as compared with oils of like gravity in California and the Mid-Continent, because of the necessity of shipping an excess of refined products into remote competitive markets and absorbing the resulting excess transportation costs. Happily, this differential has now disappeared. Local consumption has pretty well caught up with local production. The problem of the more or less immediate future in the Rocky Mountain States may be how to obtain the necessary local supplies of suitable crude oil to take care of the local market rather than the disposition elsewhere of a surplus.

Because of the conditions just mentioned, the operators in the Rocky Mountain area were among the first in the United States to be confronted with the necessity of working out some scheme of prorating and curtailing production and drilling. After the enactment of the so-called Leasing Bill by congress, in 1920, additional areas within the producing limits of the Great Salt Creek field, in Wyoming, passed into the hands of various operators, and these tracts were, speaking generally, adjacent to the exterior limits of the field. The Leasing Bill also had the effect of confirming title in the operators who controlled the bulk of the acreage in the heart of the field. With the title difficulties removed, an extensive drilling campaign was started in 1920 and 1921. The daily production of the field soon passed 200,000 barrels per day, with pipe line outlets for only about 80,000 barrels per day. The necessity of adjusting the production to the amount of oil that could be currently run through the pipe lines and avoiding the expense of field storage, which could probably only be filled once, compelled the operators to seek some solution. The oil was of about 37 gravity, and entirely free from sulfur or other impurities, but was then commanding a price as low as 50 cents per barrel, which was quite likely to go lower if an extensive program of field storage had to be undertaken. The operators finally agreed to prorate their respective productions down to a total equal to the pipe line capacity, and agreed upon a program of limiting the number of wells to be drilled, so far as possible, under lease and statutory requirements. The major operators in the field took a large and fair view of the situation, and the attitude of the government was sympathetic. It must be remembered, however, that the initial efforts in the Salt Creek field, along the lines of conservation and curtailment, preceded by several years the campaign of education which has produced such excellent results throughout the industry within the last year or two, and I am frank to admit that the successful prorating of the Salt Creek field depended at least as much upon the inadequacy of the pipe line outlets as it did upon any well-informed co-operative spirit among the operators. However, the operators who participated in the curtailment program there gained such a knowledge of the benefits to be derived from sensible and orderly production, that the education thus obtained has had, in my judgment, far reaching effects elsewhere.

Unit Operation

The application of the principle of unit operation in the Rocky Mountain area is much more feasible than in the Mid-Continent, because of the generally larger areas of the tracts held under a single lease. This is partly due to the large amount of government land and the unsettled character of the country, and partly to the fact that single structures are usually pretty well leased up in advance by the operator proposing to undertake a wildcat well. The expense of wildcatting in the Rocky Mountain area, where the structures are frequently 25 or even 100 miles from a railroad, and the roads for the transportation of materials and supplies hardly passable during the winter and spring months, renders it imperative that the operator undertaking such a venture, collect the greater part of the acreage on the structure to be drilled. Furthermore, as above indicated, where government land is involved, the operator usually starts with a permit, or lease, covering 2560 acres, which, in most instances, is sufficient to cover the entire producting area of any new field to be opened up, because the Rocky Mountain structures, speaking generally, are of the sharp-dip, small-area variety. For example, the Rock River field, in Wyoming, which has produced over 11,000,000 barrels of oil; the Fort Collins-Wellington field, in Colorado, which has produced about 3,750,000 barrels of oil; the Hogback field, in New Mexico, which has produced about 750,000 barrels of oil; the Rattlesnake and Table Mesa fields in New Mexico, which have produced over 1,000,000 barrels of oil; the Lost Soldier field in Wyoming, which has produced almost 11,000,000 barrels of oil, and the Moffat field in Colorado, which has produced over 3,000,000 barrels of oil, are, for all practical purposes, each controlled by a single operator. Furthermore, there are a number of other fields, such as Cat Creek in Montana; Elk Basin in Wyoming; the Big Muddy field in Wyoming; Hamilton Dome in Wyoming; Lance Creek field in Wyoming; Mule Creek field in Wyoming, and many others where only two or three operators are involved. This makes it possible for a very few operating companies to get together and agree upon any program of prorating or curtailment which seems sensible and economical in the light of conditions from time to time existing. For that reason, before there was any general discussion of unit operation, gas conservation, prorating and curtailment, the Rocky Mountain operators had entered into a variety of agreements of this character. By way of illustration, the deep sand at Grass Creek, Elk Basin and Little Buffalo Basin fields in Wyoming, may be mentioned. The Rocky Mountain operators are at present engaged in an attempt to work out some proper prorating of the Oregon Basin field in Wyoming. Many of the operators who recently met for the purpose of discussing a prorating agreement in Oregon Basin, sat around the same table when the question of prorating Salt Creek arose several years before, and many matters which were then the subject of heated, and at times acrimonious debate, are now taken as settled. In other words, the prorating of the Salt Creek field had an educational effect upon

Rocky Mountain operators, which, over a period of years, may prove quite as beneficial as the immediate effects of the Salt Creek agreement.

Government Cooperation

To all of the efforts of the operators in the Rocky Mountain area along lines of sensible and orderly production, the United States was a necessary party, because of its royalty interests, and I have no recollection of any instance where the representatives of the United States were not perfectly willing to cooperate along any fair and reasonable lines so long as they were not asked to sacrifice unreasonably their own interests as a proprietor. In other words, there were times when a great deal of pressure and persuasion had to be brought to bear upon individual operators, but I do not remember any serious opposition, or obstruction, on the part of the federal government.

At the present time, in the Rocky Mountain area, there is a shut-in production of light oil of about 250 barrels per day at Hogback in New Mexico; about 1000 barrels per day in Rattlesnake in New Mexico, and possibly 75,000 barrels per day in the Salt Creek field in Wyoming.

Of the heavier oils, there is a shut-in production on the Iles structure in Colorado of about 6,000 barrels per day; at Hamilton Dome in Wyoming about 900 barrels; at Mule Creek in Wyoming about 900 barrels; at Oregon Basin field in Wyoming about 7500 barrels per day; at Grass Creek in Wyoming about 6500 barrels per day; and in the Soap Creek field in Montana about 1500 barrels per day. There is some other shut-in production of heavy oils in the Maverick Springs and Sunshine fields in Wyoming, and elsewhere, which it is difficult to rate, because no reliable production test has ever been made, due to the absence of pipe line facilities.

It is to be observed that the light oil production, shut in and not now being marketed, is inconsiderable, aside from the deeper sand production of the Salt Creek field, and even this is by no means an unwieldy reserve for the great refinery of Midwest Refining Company and Standard Oil Company of Indiana, at Casper.

The heavier oils present what is at this time a real problem to the producer in the Rocky Mountain area. So far as their gasoline content is concerned, they could probably be largely utilized by local refineries at this time, but the fuel oil residue is, to a large extent, unsalable, at any reasonable price. There are very few industrial users of fuel oil in the Rocky Mountain region of any consequence, and the railroads are able to obtain an abundance of cheap coal along their lines. It is doubtful at this time whether some of these heavy oils will lend themselves very readily to cracking. The result is that although a fair price can be obtained for the small amount of gasoline contained in these crudes, the fuel oil residue either cannot be marketed at all, or at such a price as to necessitate a field price for the crude oil which is below the cost of production. For example, in the Oregon Basin field in Wyoming, the cost of the wells will probably average in excess of $50,000.00 each, and the field price which any refienery is now warranted in paying for any considerable quantity of the crude oil, in view of the fuel oil problem presented, is wholly disproportionate to drilling and production costs. The Rocky Mountain operators feel that these heavy oils will eventually have a value, but the immediate outlook is not very encouraging to the producer.

While the matter of re-pressuring the Rocky Mountain fields, and experiments with gas, air and water drive, have not progressed very far, this subject is now being thoroughly studied and tried out, and it is to be presumed in some of the fields, at least, the production can, through modern, scientific methods of this character, be increased and prolonged.

Wildcat Explorations

With respect to areas in the Rocky Mountain region yet to be prospected, I have been too long in this business to hazard a guess as to what may, or may not, be accomplished. The whole area has been pretty well combed by geologists and operators, and a tremendous amount of money has been spent in fruitless wildcatting. Some of the geologists and operators feel that there may yet be opened up in the Rocky Mountain region, one or more profitable oil fields in the Tertiary formations. It is quite likely that additional heavy oil structures will be brought in in the Big Horn Basin in Wyoming, and possibly in the vicinity of the Black Hills. While Montana has been pretty thoroughly prospected, it is a large state, and still presents the possibility of some other light and heavy oil fields. While the Mancos formations in western Colorado have been thoroughly prospected so far as surface structures are concerned, it is possible that some other fields may be opened up in that area. The abundance of source material is encouraging. Eastern Colorado still offers some promise of production from the Cretaceous formations. It is very difficult, however, to map out any structure from surface indications because of the unbroken flat terrain, and it is likely to be sometime before any considerable subsurface data can be built up. While I have included New Mexico as among the Rocky Mountain states, the southeastern portion of that state, which is on the edge of the Great Texas Permian Basin is, from the oil man's standpoint, a part of Texas rather than New Mexico and presents the same possibilities for production as other highs around the rim of that basin.

I should say, speaking generally, that most, if not all, of the structures in the Rocky Mountain region, within a reasonable distance from the railroads, or other main roads, where there are any surface evidences of structure, have already been prospected, and future development will be in more remote sections and a greater distance from railroad transportation. The cost of wildcatting will, on this account, be increased, and the drilling, in most instances, will have to be deeper. In the absence of some development, which I think no well-informed person in the business in the Rocky Mountain area anticipates as likely, the day of any adverse differential against the price of Rocky Mountain crude oil is definitely past. There is, at the present time, no overproduction of any consequence in the Rocky Mountain States, except an overproduction of heavy oil, due to the peculiar difficulty of marketing fuel oil in that region at any price which will warrant paying for the crude a sufficient amount to defray the cost of drilling and production.

Production Statistics

In the year 1887—the earliest year for which any reasonable authentic record exists—the total crude oil production in the Rocky Mountain States was 76,295 barrels. From that figure it rose gradually to 824,000 barrels in 1892, and declined from that point, with minor fluctuations until 1912 when the production jumped to 1,366,000 barrels as against 280,000 barrels the preceding year. There was a steady increase in production in the Rocky Mountain States from 1912 until 1923, when the peak was attained of over 47,000,000 barrels. Since 1923, the production has declined to 30,000,000 barrels in 1927, and something less than that figure is promised for the year 1928. Throughout this entire period, the consumption of petroleum products has shown an uninterrupted increase.

While the total oil production of the Rocky Mountain States is of minor consequence compared to the enormous total yields in Pennsylvania and the other Eastern States, and in Oklahoma, Texas and California, it may be of interest to know that the total production of the Rocky Mountain States from the original discovery of oil up to October 1, 1928, has approximated 350,000,000 barrels. The daily average production during the month of September, 1928 was 81,426 barrels, with a substantial amount of production shut in.

Whether this region, exclusive of southeastern New Mexico, which as I have already stated is generally regarded by the fraternity as more closely related to Texas than to the Rocky Mountain States, will ever again produce in one year as much crude oil as was produced in 1923, is problematical. As to this, one man's guess is as good as another's. Certainly, however, it can be safely assumed that the consumption of petroleum products in the Rocky Mountain States will continue to increase.

Unit Operation Delaware Extension Pool, Oklahoma

By I. L. DUNN and JAMES O. LEWIS
Petroleum Engineers, Tulsa, Oklahoma

THE experience of the writers, beginning in 1912, in repressuring old properties in the Eastern fields convinced them that it was highly desirable to operate a pool of oil as a unit, and that a large unit was desirable, for only in this way could the fullest possible oil recovery and the greatest financial success be obtained.

Acting on this experience, the writers endeavored to interest property owners in Oklahoma in combining old properties for the purpose of repressuring. The first unit formed was in the Lenapah, or Elliott pool, in Nowata County, Oklahoma, which has been described by Lindsly[1] and Roth.[2] In this small pool were three property owners. The property of one was purchased by the other two, and at the suggestion of the writers the interests of these two companies, the Tidal Oil Company and the Prairie Oil & Gas Company, were consolidated by exchanging undivided interests in their respective properties in proportion to their respective daily net productions. Thus each company acquired equal interests in every property in the field which could then be operated as a unit. Repressuring was successfully applied under the direction of the writers and after the end of the first year, management was turned over to the Tidal Oil Company, which had the major interest in the pool.

Following this consolidation, attention was turned to the Delaware Extension pool in Nowata County and afterwards to several other smaller pools. As the operations in the Delaware Extension pool were on the largest scale and best illustrate unit operation, this pool has been selected for analysis.

The primary purpose of this article is to show what the writers' experience has taught with regard to unit operation in repressuring old properties. In order to bring out the advantages and disadvantages, it is desirable to detail some of the experiences encountered in effecting consolidation and in operating the combined properties afterwards. As the human element is a very important factor in effecting unit operation, it will be necessary to deal with the personal element more than might at first seem justifiable in a technical article. This necessity becomes apparent when one considers that the technical arguments for unit operation are wholly favorable, whereas the diffculties of effecting consolidations and the apprehensions as to the success of unit operation are based upon legal and human factors.

As may be seen from the map (Figure 1) the Delaware Extension pool is a narrow irregular strip some eight miles long. Production is found in a lens of Bartlesville sand which passes into impervious shale north and south of the pool. On the west end the sand body becomes discontinuous and production terminates at the point shown on the map. On the east end, the Delaware Extension pool is separated from the Childers pool by an area of thin shaley sand. The pool is thus isolated.

The Delaware Extension pool was first drilled in 1911. Production was found at a depth of 700 feet on the east end which increases to 1200 feet on the west end. In parts of the pool wells up to 1000 barrels initial production were found. Vacuum was applied about 1916 and by 1926, when the pool was consolidated, the average of the wells had dropped to one-third barrel per well daily. By that time the properties were, for the most part, in a dilapidated condition; operations were profitable only during periods of high prices; the pumping equipment and lease tanks had not been kept up and corrosive water had eaten through the casing in many wells and threatened to destroy the remaining wells within a few more years.

In 1923 first proposals were made for consolidating these properties, the suggestion being that inasmuch as these properties, in common with most other properties in this part of Oklahoma, had almost reached the economic limit that it was desirable to repressure but that division of ownership in this pool, which had a fairly open sand, would not permit satisfactory repressuring without all or at least a majority of the property owners cooperating. It was further represented that the only satisfactory way for cooperation was to pool the properties into one common interest to be operated under one management.

Company Formed

After many months of negotiation, a concrete proposal was made that a new company be formed to which the property owners would sell their holdings and receive stock in accordance with the relative values of their respective interests. The method of valuation proposed was that each property be valued on the basis of its daily net production. An arbitrary value per barrel was placed on all oil production, and relative values were set on gasoline production, royalty interests and surface ownership. An adjustment had to be made for properties with most wells not pumping. Extra equipment was either left in the hands of the owners or was purchased at an agreed price.

It is worth while to mention three other methods which have been used elsewhere for setting comparative values. One is to set the relative values on the producing wells: thus, if the total is 1000 wells and the lease has 50 wells, it acquires a 5 per cent. interest in the whole. Another method is to combine the two others: for instance, if the group of properties had a total of 1000 wells and 500 barrels of production, and the lease being valued had 50 wells and 50 barrels of production, it would be appraised as follows (assuming no other items such as gasoline plants, etc.):

$$\text{Value of wells } \frac{50}{1{,}000} = 5\%$$

$$\text{Value production } \frac{50}{500} = 10\%$$

Average 7½% appraised value

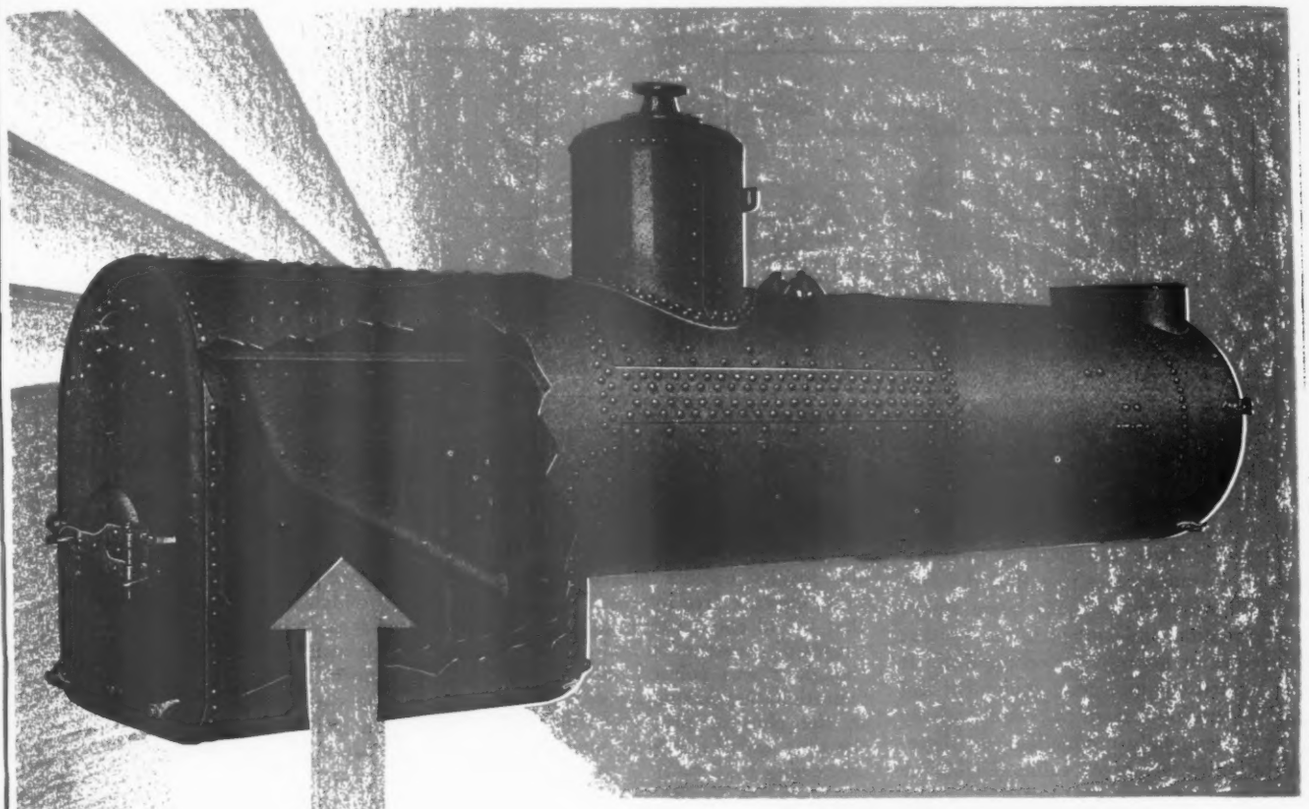
The third method was to submit the problem to a disinterested appraiser satisfactory to all concerned.

The proposal for large and small companies to get together to form a new corporation, to pool their properties and to surrender management, at first created considerable doubt. It was a departure from previous policies and the experience of both companies and individuals had led each to the conclusion that divided interests were undesirable; hence, each property owner wished to operate this property without having to consult anyone else. There were also many personal angles which arose. The viewpoint and necessities of the large companies and of the individuals were not the same, nor were the viewpoints the same for all individuals or for all companies. It is not possible in this article to go into all the personal angles that arose. The position the writers maintained was that these objections, no matter how valid they seemed, were of minor consequence when compared with the gains which could be had in consolidating their interests.

The method of appraising these properties was questioned. Each property owner was inclined to think that the natural conditions under his property or the condition of his equipment was such that it was worth more per barrel than his neigh-

[1]Lindsly, Ben E., "The Application of Compressed Air to the Elliott Pool, Nowata County, Oklahoma," Ser. No. 2778, Reports of Investigations, Bureau of Mines, October 1926.

[2]Roth, J. E., "Application of Pressure to the Elliott Pool, Nowata County, Oklahoma," A. I. M. & M. E., 1926.



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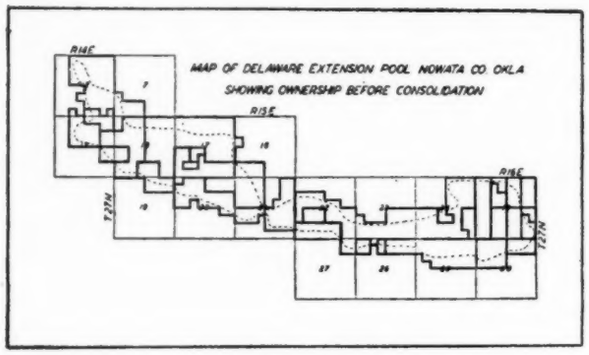

FIGURE 1

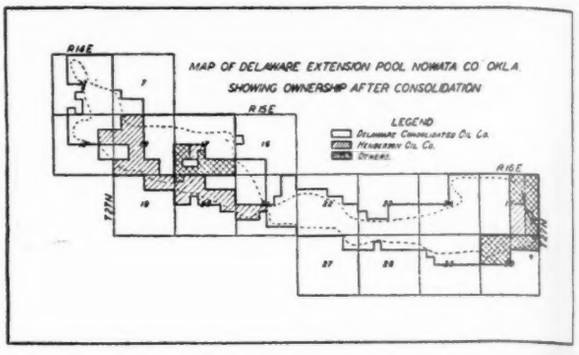

FIGURE 2

bor's and it was also maintained that some properties would respond more to repressuring than others. Our answer was that undoubtedly there was merit in these objections in many cases, but that the only practical way was to apply some simple approximation and for each one to take his chance of getting an average deal. It was pointed out that good equipment and good operation meant a comparatively large present daily production and therefore a higher appraised value, but on the other hand there would probably be less oil under the property than in one which had not been kept up; thus, to a considerable extent at least, the advantages of the well equipped and well operated property were compensated by the smaller daily production but probably larger reserves of the poorly equipped and poorly operated property.

Similarly it said that the financial results of repressuring over the life of each property could not be accurately foretold and that the results from individual operation for a particular lease might be entirely different in results from the same property when operated as a part of a large unit. It was further represented that the total profits from operating as individuals would be much less than the total profits from operating as a unit and might be the difference between financial failure and success, so that on the average property owners would certainly gain, and it was doubtful if any would get less than if he had "gone it alone."

After considerable discussion which went on for over two years, consolidation was finally effected for approximately two thirds of the properties in the Delaware Extension pool. At times it looked as if the consolidation would be complete, but for various reasons several of the smaller concerns finally withheld support. Since the date of consolidation, some of the small interests have come in or have been purchased, and some of the outstanding interests have consolidated in another small unit, the Henderson Oil Company. At the present time there are six interests in the pool, whereas originally there were 19.

After consolidating a majority of the lease owners, an effort was made to pool the royalty interests. The first proposal was that the royalty owners also come in as stockholders and receive twice the stock for a daily barrel of royalty oil as for a barrel of working interest oil. Little progress was made on this proposal, as the royalty owners objected to turning in an expense free interest for an interest that would entail participating in the expenses of construction and operation even though it was pointed out that in compensation they would acquire an interest in the physical property which was at the time worth nearly as much as the oil production.

Pooling Royalty

The second proposal was that the royalty owners make a separate pool of their own interests. For convenience the pool was divided into east and west units. If a royalty owner had a one-eighth royalty on a certain lease with a royalty production of one barrel daily out of a total of 10 royalty barrels for the unit, he would acquire an undivided 10 per cent. interest in the royalty underlying all of the unit. This proposal met with better reception but finally just failed of obtaining the consent of the minimum of 80 per cent. of royalty interests, though the writers believe that had they been able to devote more time to personal interviews, the pooling would have been consummated.

The desirability of pooling royalty interests is obvious. It would do away with all questions as to drainage between properties. It would permit fewer tanks with a lessening of expense and evaporation losses; reduce bookkeeping, and lessen other expenses and troubles in many ways. The individual royalty owner would gain by increased recovery, by bettering the quality of the oil, by spreading his chances and by making gasoline recovery profitable. On the other hand he would be taking chances that his own property would show a better increase than the average. The failure to pool royalties has increased expenses in many ways but so far no serious trouble has been experienced with royalty owners.

The Delaware Consolidated Oil Company is a simple corporation that has but one class of stock (common) and has the usual board of directors elected by the stockholders. The former owners of the properties became stockholders in the new company and have the usual rights including the buying or selling of their stock in whole or in part. The management is in the board of directors, the firm of Dunn & Lewis being employed since the beginning of operations as field managers, but this arrangement can be terminated at any time by either party. The Delaware Consolidated Oil Company is thus operated separately from any of the companies which own stock interest.

Figure 1 shows the previous divisions in the pool and Figure 2 shows the division of interests at the present time. It will be observed that in the eight miles of the pool, five miles of the eastern and central portion is wholly owned by the Delaware Consolidated Oil Company, whereas in the western part of the property there are several outstanding interests.

This segment in the eastern part of the pool is substantially a complete unit, whereas the west end of the pool is only a partly consolidated unit. The comparative experience in the two parts of the property has been particularly valuable in showing in a practical manner the advantages of unit operation in comparison with divided operation under otherwise like conditions. All the property of the company is repressured from one plant under one management; thus, side by side, the writers have been able to compare the two conditions of operation.

Equipment

Following the consolidation, which took effect January, 1926, a central air-pressure plant consisting of three 225 horsepower direct driven compressors was erected convenient to the best water supply in the field. The plant was first designed to supply pressure only to the east half of the property. Results of repressuring are shown in the graph, Figure 3. When the construction of the plant was about completed, the wells in this part of the property were opened to the atmosphere so that production was off for nearly three months, during which time air was also being forced into the pressure wells. Meanwhile tests were made on the wells which indicated that an area of very open but productive sand wound irregularly through the pool. After pressure had been applied for several months, it was found that this loose streak was taking practically all the pressure and in some places by-passing had started and was threatened

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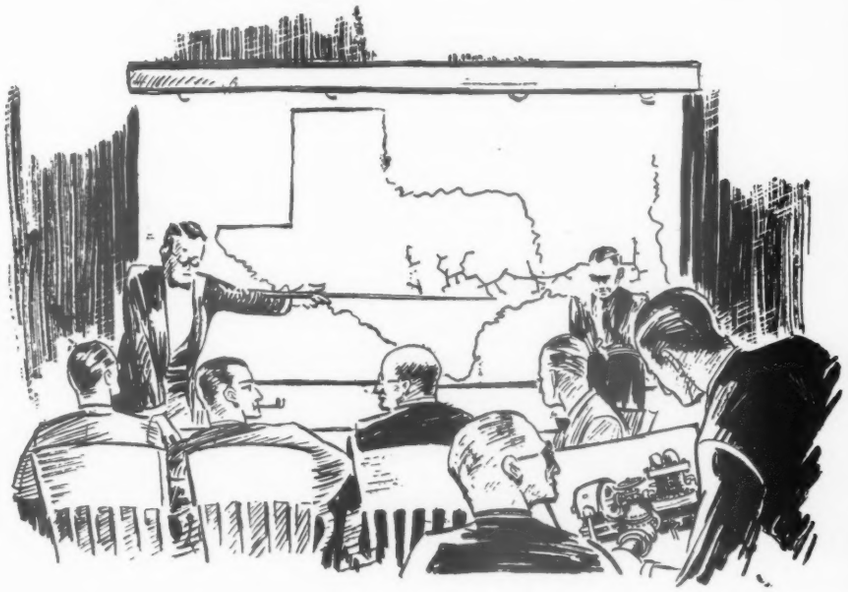

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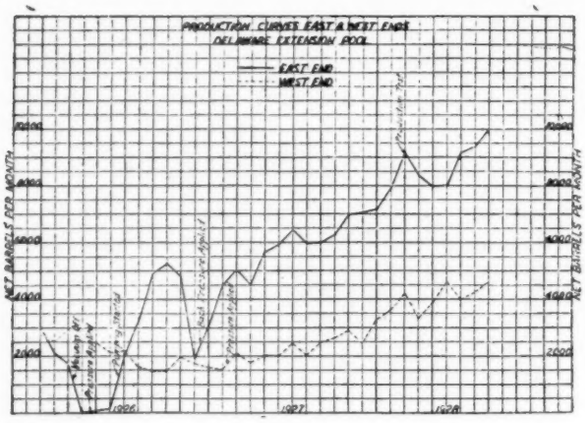


FIGURE 3

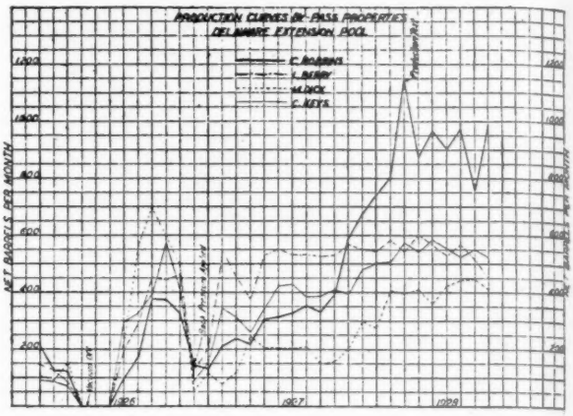


FIGURE 4

in still others. To control this situation two methods could have been used. One was to cut down the input on the air wells feeding this strip, the other was to build up back pressure on the by-pass wells in the strip. For several reasons the latter course was chosen as in the end being the more practical and desirable under the conditions in this part of the property. At the present time back pressures as high as 180 pounds are being carried on some wells. This procedure illustrated at once the advantages of consolidation, for had the properties not been pooled this choice would not have been possible. Later in the application of pressure to the extreme east end and to the west half of the property, the second course had to be pursued where by-passing was threatened, as the holding of back pressures on producing wells would have forced production onto adjacent properties.

Back pressure was applied to certain pumping wells while others were completely shut in for a period of three months. As the properties on which wells were back-pressured were likewise the ones that had responded first, the production was cut down for about two months as is shown in the accompanying Figure 3. From time to time since, the back pressure has been raised on these wells or has been applied to other wells until some wells are now under back pressure as high as 180 pounds with an input pressure varying between 225 and 250 pounds. The method has to our minds been eminently satisfactory as it has enabled the entire property to be operated at the same pressure from the same plant and same pipe line system. The seeming loss in pressure resulting from holding these high back pressures has been regained by flowing the wells and by other methods. With passing time these properties which first had to be closed in, in all but one case have regained and then passed their previous maximum production without further trouble from by-passing. Examples of some of the properties which threatened to give most trouble are shown in Figure 4.

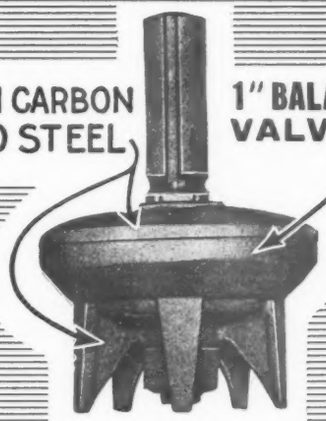
After a successful demonstration on the east half of the property, three more units were added to the compressor plant and the program of repressuring the west end was undertaken. The difficulties of repressuring under divided ownership at once came to the fore, though the difficulties were mitigated materially by establishig cooperation with the Henderson Oil Company, which had consolidated several interests and purchased others. The cooperative arrangement provides simply that the two managements shall agree to alternate pressure wells along the lines and to inject the same total quality of air into the line wells.

Notwithstanding the cordial and intelligent cooperation from the Henderson Oil Company, the disadvantages of divided ownership of the pool have been very evident. The disadvantages of divided ownership in a pool are similar in many ways to the disadvantages of undivided interests in a single property to which the oil man through many unfortunate experiences is always averse. The Delaware Consolidated Oil Company had to wait until this agreement had been arranged and until the Henderson Oil Company was prepared to go ahead with its part of the program. In spite of the agreement as to putting in equal volumes, there must of necessity be careful operation along the property lines to see that the respective interests are protected. On the east half of the property, when a problem is confronted, the solution lies almost solely in what is to the best interests of the pool, but on the west end of the property, account must be taken of what will be the effect on the neighbor's property. The Henderson Oil Company is faced with the same situation. Each company is making every effort to carry out their agreement in entire good faith and as far as possible to look at their respective problems as a matter of common interest, but there is a clear limit placed upon the operation of the properties by reason of self-interest, which the writers do not see any way to overcome. The results are shown strikingly in operating the east and west end of the properties by their respective production records. (See Figure 3.) There being no operating agreement with the third interest in the west half of the pool, it has been necessary to continue vacuum and to repressure around their property in such manner that oil is not forced onto it. (See Figure 2.) The only vacuum now in the Delaware Consolidated pool is on and around this outstanding interest. The considerable expense entailed is wholly unnecessary from the standpoint of oil recovery alone, but is a necessity under the conditions which prevail. In effect it will be inadvisable to repressure within two locations around this property for as long as this condition continues.

The west end of the Delaware pool has every appearance, from its natural conditions, of being fully equal if not better suited to repressuring than is the east half, but the dissimilar results are clearly shown by comparing the two curves in Figure 3. The application of pressure on the west end started in May, 1927. By no means has the maximum result been reached for the west end of the property under the present operating conditions; nevertheless, it is clearly evident that the same increase cannot be expected for this part of the property for so long as the present division of interest continues. Time and again the application of methods which were giving good results had to be modified or discontinued because of the effect on either one or the other of the neighboring properties. As a result, the west end has increased hardly more than 50 per cent. after nearly two years, whereas the east end has increased 350 per cent.

Interference of Operation

The causes for this interference of operation are many. They concern primarily the fact that the movement of the oil and the air is irrespective of surface property lines. The threatened by-pass troubles on the east end have been described but the remedy which proved so successful there cannot be used on the west end at all. Imagine holding a back pressure of 180 pounds on a line well offset by a well under vacuum, both producing from the same open sand. When it is found that increases are approaching the line wells offsetting the property with which there is no cooperation, it is necessary to cut down the pressure and therefore to cut down and curtail results. This difficulty is of course not so marked along the lines where there is cooperation. Nevertheless the interests of both parties is to cut down on the pressure wells which seem to be



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shoving oil across the property line and to make up the total by increasing the amount of pressure going into the wells which seem to be shoving the oil toward the interior of the property. Moreover, difference in opinion as to proper method of operating the wells makes it difficult and sometimes impossible to arrange for a manner of operation which would permit the use of back pressure as used on the east end.

Such difficulties and hindrances come up in so many details that only those who have had the opportunity to compare the two methods of operation side by side can appreciate the cumulative effect. It is impossible to show all these factors by any set of figures and the writers can only state that their experience in this pool has confirmed their previous statements and intensified their feelings as to the desirability of unit operations. The evidence of these difficulties is shown in the respective curves of the east and west ends, even after allowances have been made for the fact that the west end has by no means approached the maximum benefits under existing conditions.

It is pertinent to mention here some of the proposals that have been made for effecting cooperation along property lines without the pooling of interests.

In many cases new pressure wells have been drilled on the property line at joint expense on the theory that the pressure will drive the oil equally from the line to the wells of each of the abutting properties, but there is no assurance that the air and oil will go equally in the two directions; in fact all experience shows this is unlikely and the writers have repeatedly observed instances where the pressure has traveled entirely in one direction. Moreover, it prevents one operator from using needed back-pressures if the other will not operate in a like manner. There is seldom any advantage in this effort to mitigate natural conditions and the cost of the new well therefore represents a needless expense.

It has also been proposed to keep equal rock pressure on the two sides of the line, this being determined by periodically shutting in the pressure wells till the pressure ceases to drop. This proposal is based upon the supposition that if equal pressures are opposed on the two sides of the line, there will be no movement across, but this will be true only where there is uniformity of conditions, which of course rarely occurs. The movement of air or gas through the sand depends upon two factors, first the pressure applied, second the resistance in the sand. To control the pressure does not assure equal resistance. For purposes of illustration an exaggerated condition is supposed in Figure 6. It may be seen that the pressures on properties A and B may be the same, yet all the movement be towards B.

Advantages of Unit Operation

These and all other efforts to equalize movements across property lines are confronted with the unalterable conditions underground, whose unfavorable effects may be mitigated but not controlled, and in seeking equality of results the tendency is to operate in the least effective manner. Such cooperative efforts beget differences of opinion and occasion delays, demand compromises, and cause expense. They create a situation of dual control that wherever encountered, in business, in government, in oil fields, in factories, or wherever they may be found, have always resulted in delays, expense, and inefficiency.

The advantages of unit operation divide themselves into two sets of factors; one is based upon the competition for the common supply of oil and gas in the pool, and the other concentrated operation on a larger scale. By the latter is meant the well known fact that operations on a large scale permit many economies and present many advantages when conducted under able management, but to gain these advantages the operations should be concentrated. The Delaware Consolidated Oil Company is operating 490 wells, all in one pool and under one farm boss. This condition is entirely dissimilar to a company which may have the same number of wells but scattered among many widely separated leases.

The advantages of such concentrated operation on a large scale are so well known that it is unnecessary to devote much space to proving them, but it seems desirable to present some concrete evidence of such advantages for this pool.

As stated previously, the Delaware properties extend over a length of eight miles. There are in all 4140 acres of property, on which a total of 629 producing wells have been drilled. At the present time there are 34 air wells, 286 wells pumping, and 170 wells with casing eaten through which are not now pumping. A program is under way to reclaim these 170 wells and eventually perhaps 50 of the 139 abandoned locations will be redrilled. This gives an over all picture of the magnitude of operations.

The first evidence of the advantages of large scale operations was in the construction of the pressure plant. At only one place on the property was there a water supply adequate for satisfactory running of compressors. The construction of a single plant located at this site rather than many small plants has greatly reduced the total investment. Our experience has been that it costs about $125 per horsepower for a small pressure plant, whereas the expense in this instance has been $90 per horsepower, with a total saving to date of approximately $45,000, based on this standard of comparison. The saving in cost may be shown in another way. Our experience in the Mid-Continent and other fields indicates that for a smaller property of otherwise comparable conditions, say of 50 wells, the cost of applying pressure, including the pressure plant, gas gathering lines, pressure wells, and other costs directly concerned with repressuring, will average $500 per well, whereas the same cost on this property will be around $250 per well. The repairs of wells, tanks, and other production equipment is not included in this figure, as this cost is not part of the pressure plant construction and is being charged to current lifting expense. It may be seen that a saving of approximately $125,000 is indicated from putting in one system covering 500 wells instead of 10 plants each covering 50 wells. The actual savings over what would have been done under divided ownership cannot of course be closely estimated but it doubtless would have been some place between these two figures.

Economies

Operating on a larger scale has also permitted the utility of second hand equipment in a way which would not be possible on a small property. A welder has been employed constantly and his savings have been a large but unknowable amount. The pumpers have been reduced from 15 to 8, although production is now three times as great—each man now pumping 63 barrels daily instead of 12½ barrels. Pumping expense, exclusive of reclamation work, construction and air plant expense, has been reduced from $4400 to $2100 monthly, and pumping expense (not lifting expense) has been reduced from 83 cents to 17 cents per barrel. The concentration of operations has permitted the working out of many new things around the compressor plant and the property which a small operator could not undertake.

The problems represented by deteriorated equipment were found to be fully as important as repressuring. Under the previous conditions there was not enough profit to maintain equipment. The new conditions gave prospects for another 20 years' production and this required that the property be completely rehabilitated. Corrosive water from the Oswego lime found 400 feet above the producing sand had eaten through the casings of 210 wells which were not pumping, and 30 new wells have gone to water since. This presented a practical problem which had to be overcome economically, otherwise the property would be a financial failure, even though a large increase in oil could be obtained.

A satisfactory method was worked out for recasing the wells with small pipe and reclaiming the old casing in the wells. Eighty-five wells have been reclaimed as air wells or pumping wells and two crews are now working continuously on this program, which will take at least two more years to complete. Once reclaimed, the wells are expected to outlast production. The cost of recasing the oil wells, including cleaning out with air, mudding the new pipe and pulling the old pipe, will average $450 in first cost. The reclaimed pipe is used on the property or sold and the net cost, allowing current prices for such second pipe, will not exceed $250. As the cost of reclaiming and cleaning out wells by previous methods would probably average $1000, the savings will eventually

amount to several hundred thousand dollars. The cost of reclaiming these wells and also repairing tanks, powers, etc., is being charged currently to lifting expense, which nevertheless has decreased from 83 cents to 56 cents per barrel.

This description of the method and cost of reclaiming wells is cited as one example of an advantage accruing from operating on a large scale in one district. Similarly every lease house has been rebuilt, every tank has been redecked and repaired, and the old gas engine powers are now being replaced with old drilling engines, which will be placed on the property at $60 each (salvage value may change this cost to a profit), and will be run by air pressure; thus, effecting a large economy both in initial and operating expense and permitting an increase in production. However, the use of steam engines in this manner is a temporary expedient to bridge the gap between present conditions and the ultimate plans. At present 12 wells are being flowed and experiments are going on towards the working out of a method and system of putting all the wells to flowing.

In addition to these improvements, the large scale operations permitted the development of others which ultimately will greatly reduce operating expense or increase the total recovery. They include an automatically controlled air-lift for circulating water at the pressure plant, automatic shut-down protection to the compressors, methods of utilizing the air-gas for fuel and two safety devices that permit the return of the air-gas to the ground.

The latter are of especial importance. The use of gas is almost prohibitively expensive for such a property and unless the air-gas is returned to the ground, it will intime get too lean for fuel. Moreover, the use of air alone for repressuring does not eliminate hazards, for more trouble has been encountered in the west from the ignition of lubricating oil, which has been carried from the compressors into the air lines, than from gas-air mixtures. These two devices make explosions almost inconceivable.

In Figure 5, the lifting expense, pumping expense, and the net production are shown graphically. During the first two and one-half months in 1926 the operating of the leases was under the previous owners of the property. This gives a comparison of the lifting expense under the old and new conditions and increased productions. But the significance of the present expense can be gained only by an itemized analysis of the lifting expense, which includes not only the usual pumping, pulling of wells, and running of the oil, but also the operation of the compressor plant and the reclamation and repair of wells, houses, and tanks, powers, previously mentioned.

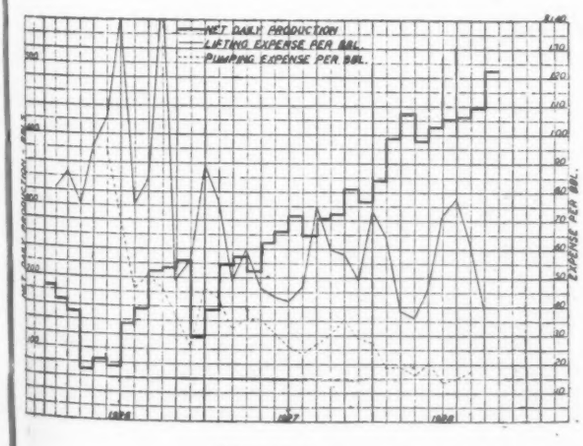

FIGURE 5

Analysis of Lifting Expense First Seven Months 1928

	Per Net. Bbl.
Pumping	$ .170
Air plant proper	.095
Vacuum plant	.005
Reclamation gas lines and additions to air lines	.165
Reclamation of wells	.095
Reclamation of tanks and houses	.030
Total Lifting Expense	.560
Estimated Reclamation Expense	.27
Estimated Regular Lifting Expense	.29

The "regular lifting expense" consists of pumping expense, air-plant and vacuum plant expense, and an allowance of two cents per barrel for ordinary maintenance. On this basis the average "regular lifting expense" for the seven months would be $3700 as compared to the average lifting expense for the two months of prior operations of $4417.90, thus indicating a reduction of $717.90 under what may be termed "normal expense" in spite of the fact that the expense of operating the air plant has been added.

A comparison of the production and expense of the two parts of the property is suggestive. The averages for the three months of June, July and August, follow:

	East End	West End
Air Wells	18	15
Wells Producing	138	154
Net Production Monthly, Bbls.	8,830	4,292
Total Lifting Expenses Monthly	$3,559.50	$4,171.98
Lifting Expense per bbl.	$ .413	$ .970
Lifting Expense per well per mo.	$ 25.79	$ 27.09 (pumping wells)
Daily production per well, bbls.	1.84	.83

It will be observed that the expense per well is substantially the same on the two parts of the property, the reduction in the lifting expense per barrel on the east end of the property resulting from the increased production per well. Considering the whole property, the "regular lifting expense" has averaged $13 per well monthly (producing wells) for the first seven months of 1928. Exclusive of the air plant expense, the expense was $8.50 per well month (producing wells), whereas the similar expense was $15.80 per well month for the two months prior to repressuring.

These figures show that, except for the cost of rehabilitating the deteriorated equipment, the cost of operating wells on such a repressured property can be kept below former expense, and the expense per barrel can be greatly reduced if good increases in production are obtained.

The above analyses show how the whole property is being rehabilitated out of current lifting expense, which is nevertheless considerably lower per barrel than under the old conditions. As the former property owners included some of the best operators of old properties in the Mid-Continent, this reduction in per barrel expense can be fairly attributed to the changed conditions on the property. Moreover, the lifting expense consists in major part of items which are in reality additions to property and which will not be continued beyond the reconstruction stage. The future expense on the property is to be gauged by the expense less the reclamation cost. It will doubtless take another two or three years at the present rate of repair to completely rehabilitate the property, at which time the property will be in such shape that maintenance should be a comparatively small item for years to come. At that time the production should also be considerably larger than at present and it may be expected that a lower pumping expense can then be shown. The same conditions will apply to the overhead expense which now is rather large and will continue large during the reconstruction stage.

The foregoing statements show how the construction and reconstruction on old properties can be done cheaper in large units but there are many advantages which cannot be shown in figures because there can be no figures on what would have been done had the properties been repressured separately.

One other phase of the situation shows up clearly from the experience of the Delaware Consolidated pool. Along with the good properties were many "cats and dogs"—leases which either were too small for successful operation or had too many wells abandoned, or had hard, thin or shaley sands. Such properties could not be profitably repressured by themselves and the owners would have had to abandon or sell them in either case with probable loss to their owners. In spite of the claims of some engineers that any property with an inside location is a potential repressure property, the fact remains that such small properties can seldom be handled profitably and never can realize full profits.

Lean sand properties can seldom be operated profitably alone and one company is now engaged in abandoning some 50 lean properties in Northeastern Oklahoma, yet most of such properties could be operated at a profit if consolidated with

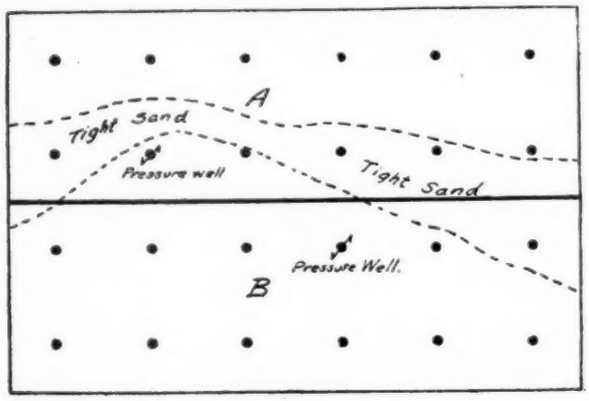

FIGURE 6.
Hypothetical Case showing Possible Effect of Tight and Open Sands in Distribution of pressure across property Lines. Practically all of the benefits in this case would accrue to property B, even if pressures were kept the same on the two sides of the property line.

good properties in a large unit that would permit construction of a repressuring system and reduce the unit expenses. In this manner such old production could be saved.

It is worth while to discuss the bearing of this experience upon the consolidation of other pools. It is obvious that, except for the lack of precedence for the proposition, a consolidation of such old unprofitable properties offered less difficulties than consolidating a pool where the properties were still profitable, particularly during the early stages of development when the values remain largely unproved. The principles are in both cases the same, but the practical details of consummation are subject to the conditions found in each pool. To get a background for considering the principles referred to, it is necessary to put one's self in the position of a property owner. Before any of us would be willing to surrender our property to a corporation, we would want to be convinced that this step would result in greater gain than by continuing operations separately. As a property owner, we would first want to be convinced that unit operation was technically correct and would permit larger profits. We would then want to be convinced that the new management would be competent to take full financial advantage of the technical and practical opportunities offered by unit operation and would be fair and impartial to all interests. Thirdly, we would want to be assured that fair equities would be set up among the property owners when the interests were pooled.

Taking these three principles in order, it is comparatively easy to convince experienced oil men that the operation of a pool as a unit and the consolidation of properties into larger units are both technically correct, but it is necessary to go a step further and convince them that the advantages are so great that it warrants letting the property pass out of his own hand into the management of others. When it comes to management, it is not only necessary that he be convinced that the proposed managers be competent but that the machinery effecting consolidation be responsive to the stockholders' interest and that a minority stockholder will have a means of safeguarding his rights. Finally there is the most difficult problem of all—that of establishing equities.

Valueing Properties

It is of course obvious that there would be wide differences of opinion as to the values of properties and it is not only necessary that each interest concerned be convinced that a fair value has been established on his own property but that the properties of the other members of the proposed consolidation are not being overvalued. There is not only a question of the actual sales value of the properties at the time of consolidation, but of their potential values and even of the nuisance values. Properties will not be operated in just the same manner after consolidation as before and therefore the elements of value may change; thus, in repressuring properties, the vacuum plants may be done away with, the gasoline plants either are converted into compressor plants or the machinery is discarded. There is also the question whether the gasoline plants after repressuring starts will be profitable and whether gas contracts should be given a value. These and many other questions enter into the problem of establishing equities in old properties.

In new properties there are such questions as the value of the properties on the crest of a structure which contains gas. Gassy properties, such as occurred in the Cromwell pool, might produce considerable oil under divided management, yet be destructive of far greater values on surrounding properties by blowing off the gas pressure and drawing oil into the gas sand. Under unit operation, this part of the pool would be shut in, it would produce less oil but would permit much greater recovery from the pool as a whole; thus, it is seen that such a property has a value; first, on the basis of what its operating profits might be under divided ownership; secondly, the nuisance value of the gas pressure which could be wasted; thirdly, gas pressure which could be conserved under unit operation; and fourthly, the value of the gas which could be saved and sold.

The adjustment of equities in a situation which seems to be so hopelessly complex points to three conclusions; first, that the establishing of equities must be approached with a spirit of give and take; second, that the method of establishing equities must be simple even though only approximate and must cut across the minor factors; third, that the property owners must be so convinced as to the desirability of effecting consolidation that they can enter into it in a state of mind to waive all but the major considerations.

The state of mind is all important and it is useless to discuss details of establishing equities until the property owners have become so desirous of consolidating that they will "cut the Gordian's knot" instead of trying to unravel it. If two parties are earnestly desirous of consummating an agreement, a way will usually be found, but if their desires are half hearted, minor difficulties become insuperable. For this reason the writers have deemed it more important that the oil industry become convinced of the desirability of unit operation than to set forth a detailed program applicable to all cases. In fact, no such general detailed program can be made out. Only guiding principles can be set forth and then the parties concerned must work out among themselves the details which satisfy themselves or what is most likely to be the solution, to appoint a board of appraisers who would have to be disinterested, competent and of unquestioned integrity.

The most difficult cases are the consolidation of fields in the flush stage of development. It is not so difficult to consolidate a block of leases in advance of the test well nor after the field has been drilled up and the worth of all parts fully disclosed. While admitting the difficulties of appraising properties in a flush pool, the writers believe this aspect has been greatly exaggerated for the flush stage is a transitory condition. If it were necessary, no attempt need be made to consolidate the flush pools, for if in future all nearby leases were consolidated prior to each wildcat test, this problem would quickly solve itself; because, each new pool would be consolidated in advance of flush production and each of the present flush pools would soon reach the settled stage. The difficulties of consolidating flush pools have colored all opinion as to the practicability of consolidations, yet this problem is comparatively of minor importance.

As a result of the writers' experiences they are now of the opinion that it will seldom be possible to get complete consolidation of a pool entirely by voluntary agreement, especially among royalty owners. If complete pooling is to be generally achieved, it will, in the writers' opinion, be necessary that some legal means be provided for a majority rule that, under proper safeguards, will enable a majority opinion in a pool to compel an obstructing minority to enter into the agreement just as is done in all our legal entities, such as cities, corporations, etc.

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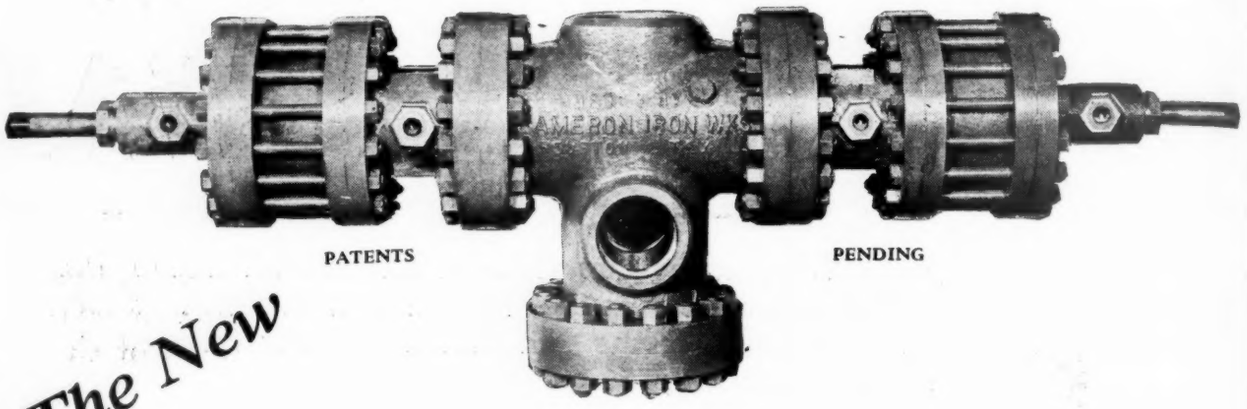

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Gas Conservation and Production In California

By M. E. LOMBARDI
Standard Oil Company of California

CONSERVATION as applied to both natural gas and oil is usually taken to mean prevention of waste in a physical sense. Produced oil is no loner allowed to go to waste as it may be run into storage almost indefinitely and ultimately put to its best uses. When natural gas is produced, however, it cannot be stored and must be at once usefully used or it is blown to the air and truly wasted. The prevention of such waste may be termed conservation in the physical sense. There is, however, another kind of waste, which may be prevented by conservation methods. This is the economic waste occasioned by producing oil greatly in excess of current needs. The waste in this case is the cost of the storage containers which must be ultimately added to the sales price of the oil. Prevention of this kind of waste may be called economic conservation. This paper will be concerned with the conservation of gas in both the physical and economic sense and, to some extent, with the conservation of oil in the economic sense only. Oil of course may be conserved in the physical sense also by the application of production methods which insure the greatest ultimate recovery from sands but this is a technical problem and will not be discussed here.

From the time of the War until 1921, in California, there was no great necessity for the economic conservation of oil. The market readily absorbed production. Little concerted effort was made to conserve gas either physically or economically. The first cooperative move to conserve as that I know of was an agreement between the S. P. Land Company, predecessor to the Pacific Oil Company, and the Associated Oil Company. Their lands in the Buena Vista Hills, where an upper sand carries dry gas, were pooled for gas. All gas produced from these lands was divided on the basis of acreage holdings as determined by geologists. This agreement was effective in preventing competitive line drilling for gas and is still in effect.

In 1921 and for two years thereafter occurred the so-called flood of oil in the Los Angeles Basin, resulting in the necessity for physical and economic conservation of oil, that is, retaining it in the ground, in the older fields of the state. In 1921, also occurred the extensive and potentially serious Oil Workers' Strike in the San Joaquin Valley fields, which forcibly restricted production luckily at a time when it was not needed. The strike lasted about 60 days, but when it ended a considerable part of the production continued shut in. The larger oil companies with more oil than they could conveniently handle in the Los Angeles Basin,. shut in their heavier oils of the San Joaquin Valley voluntarily to the extent of about 100,000 barrels. It is safe to say that never since 1921 have the Valley fields been produced to their capacity.

But these restrictions of production in the Valley were more or less spasmodic and individual. In none of them did gas play a leading part and in none of them did the cooperative idea develop materially.

The cooperative idea in gas and oil conservation got its start in the Ventura field. Ventura began to loom as a potentially great field in 1925. Unlike the three great fields of 1921-1923 in the Basin (Huntington Beach, Long Beach and Santa Fe Springs), the holdings in Ventura were few and large, the companies interested at that time being the Associated, Shell, and General Petroleum. It was an ideal field for cooperative effort because it is much easier to get three people to agree than 30. To this day Ventura has led the way in California in cooperative conservation.

Ventura Field

The history and results of cooperative conservation in the Ventura field are so interesting and important that they should be studied in detail by all production engineers and executives. I will not attempt this discussion in detail here, as it has already been well done and I urge you all to read Mr. Swigart's[1] excellent paper, "Methods of Effecting Gas Conservation and Increased Recovery Efficiency in Ventura Field, California."

In general, Mr. Swigart's paper is a history of the three cooperative movements looking toward the reduction of gas and oil output in the Ventura field, which were carried out by the cooperative efforts of all of the producers of the field. The first proration period was from May to September, 1927; the second, from November, 1927, to March, 1928; and the third began in March, 1928, and is still in effect. Cooperation was and is secured through a committee of petroleum engineers representing each company. This committee represents the highest technical skill available and has kept records and studied them with consistency and patience. The committee is in a fair way to prove or disprove by intelligent work the theories that have been more or less commonly advanced but never before actually proved.

The paper points out that the Ventura field has always been a high gas-oil ratio field and that the gas pressures encountered make manipulation of flowing wells expensive and difficult. It further points out that Ventura is unique among the prolific fields of the Coast and Los Angeles Basin in that it has been very slowly developed and has stood the brunt of all restrictive efforts since the flood of oil in 1923. When a high pressure and prolific field is drilled quickly and uniformly the gas local around each well does its best work, but when such a field is developed piecemeal gas from undrilled portions migrates to wells ahead of the oil and causes extremely high gas-oil ratios. The studies at Ventura indicate that slow piecemeal drilling, when necessary, should always be accompanied by a strict control of wells under back-pressure from the beginning of development and that if this be carried out the wastage of gas and loss of oil, resulting from the above method of development, is capable of control.

Apparently all companies have and are now cooperating satisfactorily in this field, as evidenced by the fact that a considerable number of very high gas-oil ratio wells have been entirely closed in.

The method of control, in general, was either by application of back-pressure or manipulation of tubing as to sizes and depths; back-pressuring being by far the most effective. "Laws of Production" indicated are:

1. When a well is pinched back, resulting in an upward trend of production, the gas-oil ratio declines.
2. When a well is pinched back so that production remains constant, the gas-oil ratio remains constant.
3. When a well is flowed so that production declines, the gas-oil ratio increases.

All wells in a group should be sub-

[1]Swigart, T. E., Methods of Effecting Gas Conservation and Increased Recovery Efficiency in Ventura Field, California. Delivered before the Division of Development and Production Engineering of the American Petroleum Institute. June 15, 1928.

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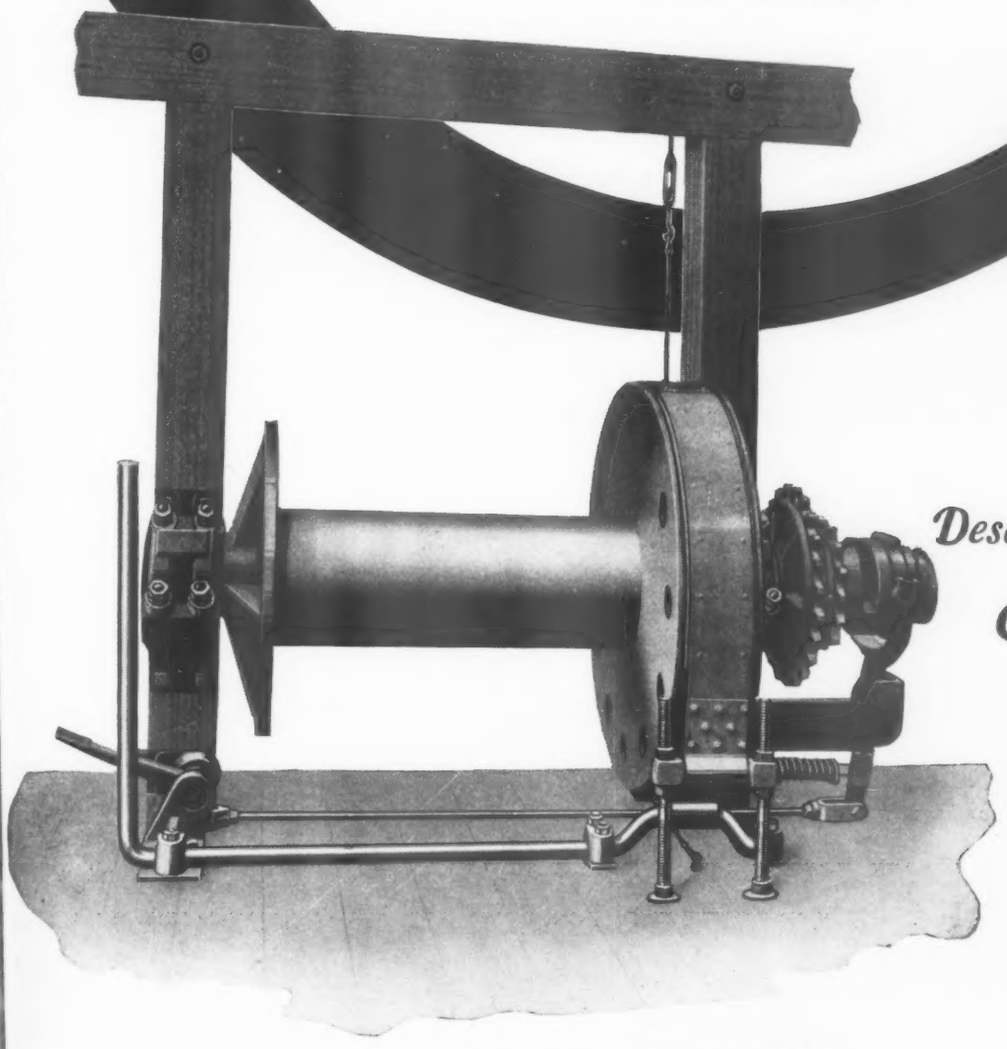

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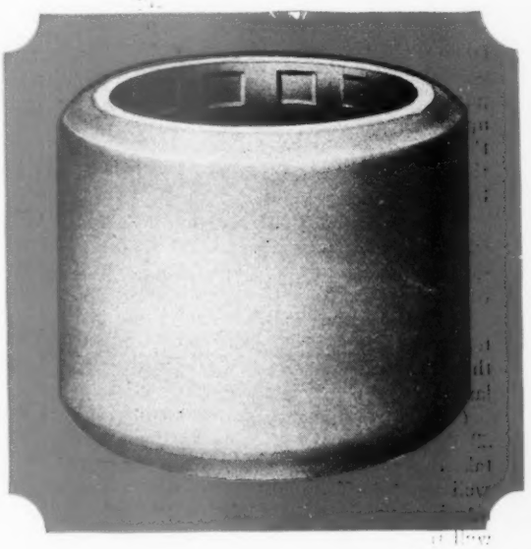

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Results in Ventura over a limited period seem to show that ultimate production can be increased by a constant vigilance in back-pressuring wells. In the case of one Shell well, for instance, an ultimate production of 497,000 barrels is indicated as a result of manipulation of back-pressure, against an ultimate production of 432,000 barrels which would have been obtained under ordinary methods of flowing.

One of the most valuable results of this Ventura study is the indication that the time element has never before been given sufficient weight in production experiments. It often takes weeks or months to determine the true effect of certain manipulations; the first apparent effect being bad but the ultimate effect being good. In other words, careful technical supervision over long periods of time is necessary to develop the best production methods.

A few words on the mechanics of the organization which carries on the work of restriction under the present program may be of interest at this point. An engineering committee was appointed by the companies operating in the Ventura field and charged with establishing "Methods whereby the shut in shall as nearly as possible constantly represent 20 per cent of the potential oil production of each company." These engineers met and drew up a memorandum agreement covering the procedure to be followed. Among the salient points covered were the following:

(a) The term of agreement was for 60 days and thereafter until 30 days' written notice should be given by one of the parties.

(b) Each new well was to be allowed to produce unrestricted for 30 days and then shut in 20 per cent. based upon the last three days of its 30-day production.

(c) New line wells are to be restricted 20 per cent., or an equivalent amount taken on other line wells as near the new well as possible. Restriction of a new interior well may be made on any other well if desired.

(d) The production on a definite date (March 6, 1928) was set as the basis for production proration.

(e) Certain wells were chosen by the committee as the most suitable for restriction and many of these were completely shut in.

The engineering committee meets at frequent intervals to discuss the progress of the restriction program and a great deal of the success of this movement may be credited to the informality and sincerity of this small group of engineers.

Coincident with the development of gas producing oilfields in Southern California came a great expansion in the use of natural gas for industrial and domestic use. In 1912 it was necessary to pipe gas from Kern County to Los Angeles since the fields of the lower San Joaquin Valley were the only known source of a natural gas supply. In 1928 gas is being pumped north through this same pipe line. This development has focused attention on the fact that our gas deposits are of great importance to the state. Gas is now "a money crop." Millions are invested in facilities both for transportation of gas and its economic use in industry. It is now realized that early exhaustion of natural gas would be a preventable calamity. The total daily consumption of natural gas in California increased from 180,500,000 cubic feet in 1920 to 561,600,000 cubic feet in 1927, and recent figures indicate that the current consumption is of the order of 750,000,000 cubic feet daily.

Figures reflecting the wastage of gas in the Los Angeles basin in 1923 are appalling. A reliable agency states that in that year, in all fields in California, 190,000,000,000 cubic feet, or, 521,000,000 cubic feet per day, were blown to the air. Of this, 64,000,000,000 cubic feet was from Signal Hill and 59,000,000,000 from Santa Fe Springs. The worst month was October, when 23,742,000 M. cubic feet, or, 765,871 M. cubic feet per day was wasted.

The above summary, intended to be brief, has been given as a background to the events which have occurred in our field of study during the past 12 months and with which we are most concerned. Until 1927, excepting at Ventura, conservation of oil was spasmodic and individual; conservation of gas hardly existed; and cooperative conservation was theoretical.

Signal Hill

Now we approach modern times. In the fall of 1927, the discovery of a deeper and very prolific zone in the Signal Hill field was an event which cast a long shadow before it. At that time there was about 100,000 M. cubic feet of gas per day being blown to the air in the state. Governor Young very wisely took note of an anticipated recurrence of a large natural gas surplus and publicly called attention to it, not limiting his interest to the conservation of gas but including the conservation of oil for the future benefit of the state.

This warning from the state executive was welcomed by most of the operators. They formed a committee, known as the "Operators' General Committee on Gas Conservation" and instructed it to study the state-wide situation and take steps to prevent, as far as possible, wastage of natural gas and oil. In January, 1928, this committee was organized and at once set about its duties. It consists of 16 members; 12 being technical or executive representatives of producing oil companies, two, representatives of gas purchasing and marketing companies, and two, representatives of state institutions (the State Oil and Gas Supervisor and the representative of the Gas Division of the State Railroad Commission). The committee is still in existence and has worked in perfect harmony; and the rest of this paper is largely a review of this committee's efforts and the results obtained so far.

At the outset it was found that no complete picture existed of the production, distribution and ultimate utilization of natural gas in the state, and steps were taken, through sub-committees, to gather data and supply such a picture. It developed that there were great surpluses of gas in Ventura, Long Beach, and (to a lesser degree) in Kern County. This was all gas being produced with oil. There are some dry gas wells in Kern County but they were, and had been for some years, shut in except at intervals to take care of peak demands. All of these fields were connected by pipe line to the great consuming center—Los Angeles and environs—and also with other fields which produced gas in moderate quantities. The connecting pipe lines were controlled by three separate interests. By comparatively inexpensive crossovers, all the pipe lines could be made inter-connecting but of course operating pressures, capacities, etc., were not always ideal.

Two facts now became apparent, first, that the gas situation in the state must be handled as a whole, and, second, that the cooperation of the pipe line companies was an essential in order to secure the best results.

Results in gas conservation have been effected in two ways.

(1) By restricting the production of gas from the sands in which it originates with the oil (hereinafter called "restriction");

(2) By reinjecting into sands from which it can later be recovered (hereinafter called "storage").

Both of these methods have their variations, of course. The first, (restriction of production), has been accomplished

(a) By completely closing dry gas wells, requiring perhaps, a compensating supply of gas from elsewhere;

(b) By restricting production through manipulation of flow orifices on flowing wells, or pinching back, to secure a desired gas-oil ratio. This has most notably been done at Ventura where a reduction of gas flow of 35 per cent. produced a reduction of oil of only 20 per cent.

(c) By entirely shutting in very high gas-oil ratio wells whose oil output was small. This was also accomplished at Ventura. Both (b) and (c) require a very high degree of cooperation between companies, of course, since they are accompanied by a decrease in immediate revenue, both from oil and natural gasoline.

(d) By holding back pressure on the casingheads of pumping wells. This has most notably been accomplished in the Kern County fields. It sometimes results in apparent loss of oil production; sometimes, not. The amount of gas sand at each well is small, but, of course, the number of wells susceptible to the treatment is very large. It also requires a certain amount of cooperation between producers.

Conservation by Storage

Conservation by storage, the second

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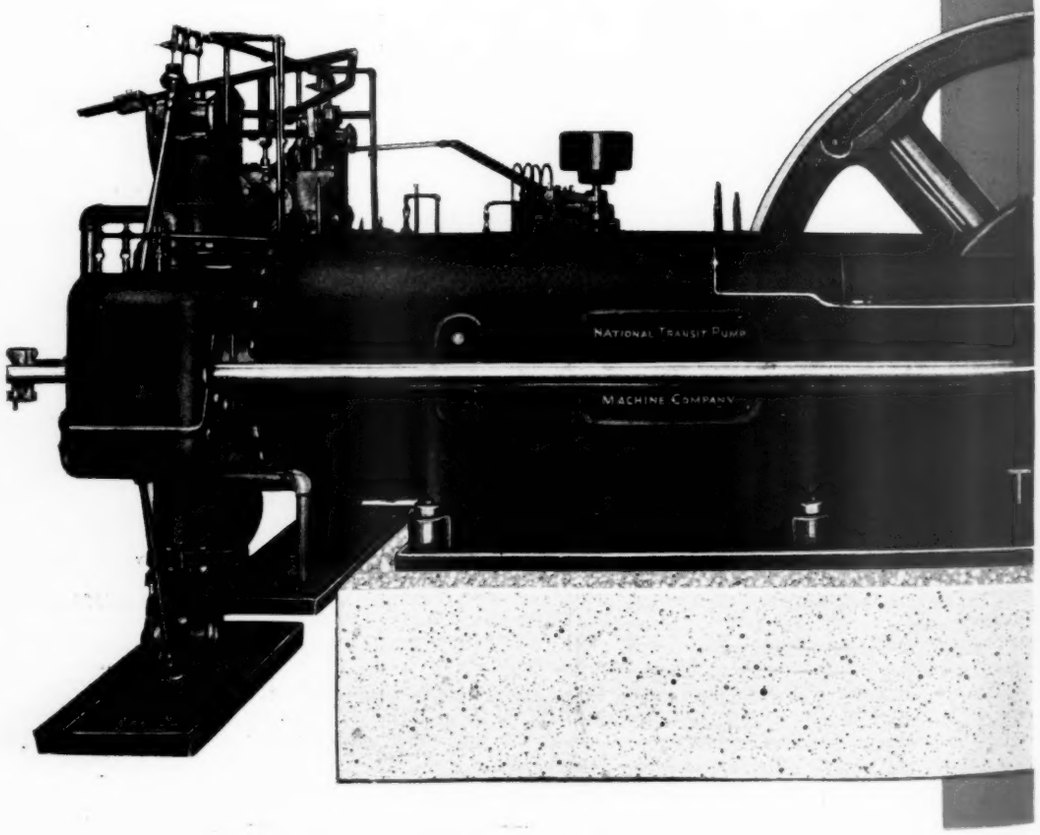

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method adopted, also has its variations. The simplest is:

(a) Storage in exhausted gas sands. This has been accomplished most notably in the Buena Vista Hills in Kern County. On this structure there exists a dry gas zone above the oil horizon, from which large quantities of gas has been taken in former years. No gas is now being taken —this by agreement between the owning companies. As much as ten million cubic feet per day has been pumped back into these sands under an agreement between the land owner (Standard Oil Company of California) and the Midway Gas Company, which will be later discussed.

Not quite so simple is (b)—Storage in producing oil zones, which have been partly exhausted, that is, when the "head is off." This has been most notably accomplished by the Union and Shell Companies and recently to a smaller extent by the Associated Oil Company in the Dominguez field in the Los Angeles basin. Close cooperation is essential, not only between producing companies on the same structure, but also between these companies and the royalty holders and, where gas is brought from elsewhere, the gas pipe line companies as well. A total of some 4,729,744 cubic feet have been stored in this structure up to October 31, 1928.

Both of the above methods of conservation — Restriction and Storage — were studied by the committee on gas conservation and put into effect by the producing companies during the past year. In the committee's first review of the situation, in March, it found that restriction of gas production was practical in almost all of the light oil fields of the state and was by far the most effective method of saving gas. It is the simplest but perhaps the most difficult of accomplishment, because it frequently, although not always, means a diminution of present income to the producer and because it requires cooperation between producers and with their royalty holders. It requires also a campaign of education. In an endeavor to supply the latter, a booklet entitled [2]"How to Increase Oil Recovery and Conserve Gas in the Field" was prepared by the committee, printed by the Chamber of Mines and Oil, and distributed to all producers through the machinery of the State Mining Bureau. This was followed up from time to time by magazine and newspaper articles. The endeavor is to make the California producer "gas conscious." It will require, of course, a constant hammering to accomplish the desired result.

Conservation by storage, the second general method employed in the state, seems to have hit the popular fancy far more than conservation by restriction. Nevertheless, it is not nearly so important, first, because gas is not valuable in its original home, second, because the volumes involved are comparatively small, and third, because it requires transporting and compressing the gas, thereby adding a cost item which must of necessity be ultimately paid by the consumer. Storage, however, is in a way spectacular, because the idea is new, and, in the minds of many, of unlimited possibilities. It is popular also, I think, because it does not require a concurrent sacrifice to the average producer.

As a matter of fact, the importance of the two methods is very well illustrated by their results so far in California. We are conserving by restriction (without taking into account shut in dry gas wells) some 180 million cubic feet per day, and by storage, some 35 or 40 million feet per day.

More Surplus

In spite of the above considerable saving accomplished through the cooperation of the producers and gas companies with the conservation committee, there is now more surplus gas in California than there was when the committee started work, by some one hundred million feet. This is the result, of course, of production from the deep sands in Signal Hill and the continued, though restricted, development at Ventura and elsewhere.

And now a further large increase in surplus gas faces us. It will come from the newly discovered lower sands in Santa Fe Springs. But before taking up the plans which have been prepared to meet this emergency, I would like to discuss some of the general phases of the problem.

According to the comprehensive report of the California Natural Gasoline Association for September, the gross production of gas from all fields of the state was approximately 1,008,250,000 cubic feet per day. Of this about 750,000,000 cubic feet was used in the fields and in outside industrial or domestic consumption. About 217,000,000 cubic feet per day was blown to the air and over 45 million feet daily was conserved by storage. In only two fields was an appreciable quantity of gas blown to the air, but these are not the only fields where restriction ought to be practiced. It is obvious that it is desirable to restrict production whenever it can be practically done, regardless of the fact that in some fields no apparent waste is taking place, simply because all gas there produced is being used or sold to gas companies. It is apparent that even if gas has to be transported into a field for local use while that field's production is pinched in, that this conserves gas by giving an outlet for gas from other fields where production cannot be made to conform to field uses and sales contracts. Therefore, it at once becomes apparent that real gas conservation must envisage the whole state and must include apparently uneconomic transportation by pipe lines between fields. This cooperative transportation is of course most important when gas must be supplied for storage in fields where there is no surplus gas.

The moment you transport gas for conservation purposes, you step into the domain of the purchasing and distributing gas companies and are dependent on them for cooperation. The gas companies of California have responded to the suggestions of the conservation committee in the best of spirit. I think everyone interested in gas conservation should read Mr. A. F. Bridge's[3] paper entitled, "Variables in Natural Gas Production and Utilization in California," which Mr. Bridge wrote at the request of the conservation committee, of which he is a member.

The very large variation in seasonal and even daily demand, the impossibility of long time above ground storage and the complexities of the problem of adjusting supply to demand without undue waste, are problems we have to deal with in attempting gas conservation which are too little understood. Mr. Bridge points out, for instance, that the seasonal domestic demand in Southern California varies as much as 140,000,000 cubic feet per day between winter and summer, that hydro-electric power generation is dependent on seasonal rainfall or snowfall to such an extent that changes in load at steam plants amounting to 25,000,000 cubic feet per day often occur due to variations in water flow at hydro-electric plants; that weekly variation on account of closing industrial plants on Sunday amounts to as much as 20,000,000 cubic feet and that, up to the present, the *supply* coming as it does from wells producing gas with oil, does not in any way adapt itself to these varying demands. As noted before, long time above ground storage to meet these demand peaks is out of the question from an economic point of view. It would, therefore, appear that there would always have to be wastage during demand periods unless dry gas wells or stored gas were available.

Of course the gas companies are as much interested as anybody in conservation since it tends to guarantee a future supply. They have interested themselves particularly in conservation by storage, of which I would like to give two examples, indicating briefly how the business side of the problem is worked out.

It was found that by reversing the flow of gas in the line between Kern County and Southern California, some 10 or 12 million feet per day could be backed up at the Southern California main compressor station in the Buena Vista Hills, Midway field. This meant an outlet for that much excess gas from the Los Angeles basin or Ventura. In order to store this gas, which had been purchased under contract by the gas company, the following agreements were made:

(1) The Honolulu and Standard Oil Companies, who control the structure to be used for storage, agreed not to take gas out of the upper gas zone as long as a surplus of casinghead gas existed.

(2) The Standard Oil Company agreed with the gas company to waive, during

[2]How to Increase Oil Recovery and Conserve Gas in the Field Prepared by Subcommittee to California Operators General Committee on Gas Conservation. Published by Chamber of Mines and Oil, April, 1928.

[3]Bridge, A. F., "Variables in Natural Gas Production and Utilization in California." A paper prepared for the Operators' General Committee on Gas Conservation.

In Church *and* Fields AREAS

A large number of pumping wells in this area have been using Byers Tubing and Casing for over three years without a corrosion failure.

* * *

The district superintendent of a prominent lease reports getting from wrought iron five times the life received from ordinary tubing.

* * *

One well showed ordinary 4" tubing completely eaten up within 31 days, compared with 2½" wrought iron in service 90 days and then used for line pipe. (Well making water and produced by air.)

* * *

A number of field superintendents have issued orders that if any of the wells are to be put on air, galvanized wrought iron tubing is to be used immediately.

* * *

One prominent producer, after making inquiry among the other companies in this field, decided to use galvanized wrought iron for all future requirements.

* * *

After trying cheaper tubing in nine wells of a certain lease, it was all replaced with Byers. Nine months later, when the last report was received, all of the wrought iron was still in very good condition.

* * *

When another make of tubing showed its first failure in a pumping well after 4 months' time it was replaced after 6 months with Byers. No trouble has been experienced to date, the wrought iron having been in the well approximately 11 months and being still in good condition.

IN this important oil pool, sulphide concentration is probably higher than in any other oil field area in the world. Here can be found cases where ordinary tubing has shown a life of but a few weeks, and failures within six months are most common. The loss of production incidental to shutting down a well for replacement of tubing, and the high cost of replacing at frequent intervals, makes it economical to use a better, though somewhat more expensive, material, such as Byers genuine wrought iron.

Due to the chemical purity of its base metal, and to its content of non-corroding siliceous slag, wrought iron shows an inherent resistance to corrosion which is of importance in fields having an adverse influence on tubing, casing, etc. The additional life given by Byers Galvanized Wrought Iron Tubing is often as much as 100% to 300% as compared with other makes of tubing.

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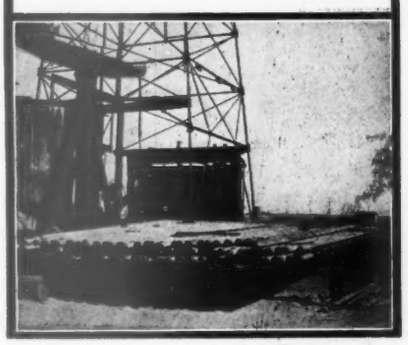

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It has steel plate rims and rolled steel channel spokes with heavy angle reinforcement at the flange.

A one-piece flange is used in heavy band wheels.

The flange is solidly riveted to the spokes and angle reinforcements.

There are no bolts in the flange. Machine driven rivets carry the heavy loads at this point.

The rolled steel tug rim is 7′ in diameter with double V groove tug.

One-inch wood cants are used.

Band wheels of 10′, 11′′* and 12′′* diameter and with 12′′, 14′′* and 16′′* face are carried in stock.

Shipped in one piece ready to be mounted on the shaft.

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The same steel tug rim used on the Moore steel band wheel is made for wooden band wheels. Brackets are riveted to the rim and they are fastened to the band wheel by means of 24 bolts. Easily attached and removed, and will outwear several wooden wheels.
This rim is of one piece, rolled steel with double V groove tug. Standard diameter is 7′.

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the same period, certain of its contract rights in regard to minimum deliveries.

(3) The Standard Oil Company and the gas company agreed that the gas company could inject gas into the zone selected through certain wells on Section 15 and could withdraw this gas free of cost until such time as the rock pressures indicated that all stored gas had been taken out or until such time as a certain percentage of the injected gas had been recovered, (between 70 and 90%). In this case the co-operation was comparatively simple, due to the fact that the oil company owned the land used in fee and to the fact that a dry gas sand was used.

Other storage projects, not so simple, are those attempted in producing oil fields where the land is leased and where the gas is injected into the oil measures. The contractual agreements necessary for this type of storage when surplus gas is brought in from outside sources should and in general do embody the following points:

Agreement Between Oil Company and Gas Company

1. Premises based on desire of gas company to store gas during low demand periods and withdraw during high demand periods and upon willingness of oil company to store gas upon theory that repressuring aids oil and natural gasoline production.

2. Points of delivery of gas to be stored, pressure (approximately 250 pounds)—installation of drips, meters, etc.

3. Rights of parties with respect to rate of injection. (Oil company should be sole judge usually).

4. Necessary compression above 250 pounds. (Oil company usually should furnish).

5. Quantity of gas to which gas company shall be entitled as return storage (may range from 70 to 90 per cent. of volume injected). Provision that oil company shall be entitled to its own field, refinery, etc. fuel or other requirements (except sales) before returning gas from storage to gas company and if return of designated quantity not made during life of field, oil company not further liable.

6. Oil company to be sole judge of its rate of oil and/or gas production, but will cooperate reasonably to provide gas company requirements. Permission may be given to withdraw from injection wells to tide over short peak demands. Pressure of return storage gas to be absorption plant discharge. Cover also who shall meter return storage gas (usually oil company).

7. Gas company to have no ownership in any natural gasoline extracted from, or any oil which may be produced by, injected gas.

8. Cover gas measurement standards, deviation factor, etc.

9. Usual force majeure clause.

10. Cover termination of right of injection and withdrawal (withdrawal usually to last over life of commercial production of field, as long as gas remains in storage to credit of gas company).

The agreement between oil company and lessor covering permission to inject gas foreign to the lease for repressuring or storage should embody the following points:

1. Premises based on desire of oil company to inject more than lease's own production of gas (such excess being termed "foreign gas") and willingness of lessor that such procedure be followed, upon the theory that increased ultimate recovery of oil and natural gasoline will work to mutual benefit.

2. Agreement may provide that oil company will not reduce total oil production by using a well or wells for injection purposes, but will increase oil production from neighboring wells on the lease to compensate.

3. Provide for measurement of foreign gas injected, deviation factor, keeping of records, right of lessor to inspect, etc.

4. Provide for elimination of gas royalties on foreign gas.

5. Provide that oil company will not inject gas in such a manner as to force lessor's oil and/or gas towards lands bordering on the lease (either by injecting in non-boundary wells only or by also increasing pressure on adjoining properties uniformly).

6. Provide that lessor not to be charged with any expense incident to the repressuring or storage.

7. Agreement to run concurrently and co-extensively with the lease.

In summarizing results obtained so far in California, we may say that gas is being conserved by restriction at a daily rate of about 180,000 M cubic feet per day and by storage at about 35,000 M cubic feet per day and that a total of 8,240,704 M cubic feet has been stored to October 31. This brings us to the present and we may now look at plans for the future and the expected surplus of gas from the deeper sands at Santa Fe Springs.

To meet this problem a meeting of all Santa Fe Springs operators was held on September 20, 1928, and October 4, 1928. The usual committees were appointed and their reports and recommendations have been accepted by the operators. The committees found that a peak output of 319,000 barrels per day of oil and 387,000 M cubic feet per day of gas was to be expected in January, 1929, declining to 111,000 barrels and 121,000 M cubic feet in July, 1929. Almost all of this gas would be surplus.

This problem is to be attacked in the two ways developed previously—by restriction and by storage. The provisions for restriction are embodied in the resolution accepted by the operators and are as follows:

"Whereas, the governor of the State of California, through the governor's Gas Conservation Committee, has called upon the operators in the Santa Fe Springs field to prevent as far as possible creating and maintaining a surplus of natural gas in excess of that which can be put to beneficial use after being separated from the oil which has been produced by said gas, and

"Whereas, experience in the production of oil has demonstrated that a larger ultimate production of oil can be secured, and a greater conservation of gas effected, by flowing wells against a back pressure controlled by flow plugs or beans, and

"Whereas, it has been demonstrated that natural gas performs a twofold function in producing oil,

"1. By decreasing the viscosity of the oil occurring in the sands, and

"2. By furnishing the energy necessary to bring the oil to the well and flow said well.

"Therefore, the Committee on Curtailment of Santa Fe Springs Gas Production recommends that a uniform practice of back pressuring in all wells in the Santa Fe Springs field be adopted for the purpose of conserving gas and materially reducing the amount of gas currently produced, so as to meet the demands of the governor's Gas Conservation Committee and to increase the ultimate recovery of oil.

"In order to accomplish this in a manner fair and equitable to all operators and others owning wells or having an interest in the production of oil and gas therefrom, it is necessary that the procedure for gas conservation shall be uniformly accepted and followed by all operators.

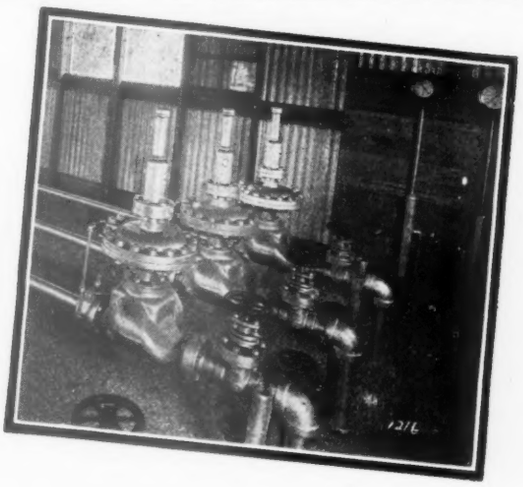
"For this purpose the Committee on Curtailment of Santa Fe Springs Gas Production recommends to the operators of the Santa Fe Springs district the following plan of action:

"1. That all new wells completed at Santa Fe Springs be produced through tubing.

"2. That all wells be equipped with high pressure casing heads and fittings capable of withstanding 2000 pounds test pressure, or better.

"3. That whenever the gas production at Santa Fe Springs exceeds the usages in the field and demands of the gas companies and the demands of repressuring and storage projects so that an actual surplus exists, each flowing well producing from zones lower than the Meyer zone shall be pinched back by a percentage of its net oil production to be set by a Control Committee, to be appointed by the Santa Fe Springs operators; the percentage cut to be uniform and applicable alike to all such wells; that each new flowing well brought in from zones below the Meyer zone be allowed to produce normally for 15 days, and that thereafter each such well shall be pinched in at the end of 15 days the total percentage cut then in effect; that said percentage cut shall be applied on the average production of the well during the last five days of said 15-day period; that if any well subject to cut shall develop pressures or mechanical conditions which prohibit the entire percentage cut then due, the company possessing such well shall make additional cuts on other wells to obtain the

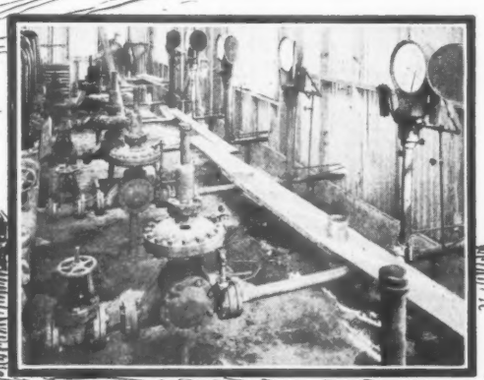
5 Batteries of Emco Flow Controllers

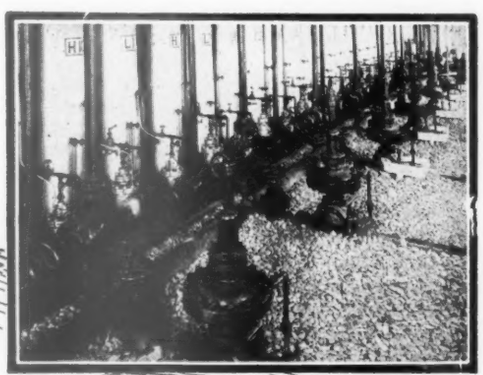


EMCO Regulation developed during 30 years of close contact with the Natural Gas Industry was the logical resource of the Oil Industry with the development of the Air Lift Process of Oil Production.

EMCO accuracy, ruggedness and design principles were from the beginning appreciated by the oil operators as witnessed by the large number of EMCO Flow Controller Installations found in the oil fields of America and other producing countries.

We are illustrating here several very successful installations of this type of equipment.





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equiavlent barrelage cut due well in question.

"4. That the Control Committee may change the percentage of cut at its discretion whenever the conditions warrant, by adding additional cuts or by reducing cuts already in effect, the same to be applicable alike to all wells.

"5. That the foregoing program shall be accepted in writing by all operators owning or operating wells in the Santa Fe Springs field.

"6. That upon acceptance of the foregoing plan, the Control Committee shall issue the necessary instructions to carry this program into effect at the proper time; that the operators of the field will furnish this committee with the necessary information as to their daily production and other pertinent data asked for by said Committee and that this Committee is authorized to call upon and be furnished by all marketing companies, pipe line companies and others running or removing oil from the Santa Fe Springs field, oil runs to determine the deliveries of all operators in the field, for the purpose of establishing complete compliance with this program.

"7. That this program shall continue in effect for 90 days from the date set by the Control Committee for the beginning of the curtailment. If one month prior to the end of the 90-day period it appears to the Control Committee that the emergency will still exist at the end of the period, the Control Committee shall so notify the Santa Fe Springs operators in order that measures may be taken to extend the period."

It is anticipated that it will be very difficult to enforce this plan in full because the heart of Santa Fe Springs is a town lot field with a large number of small producers and a host of royalty holders. If successful, the plan will conserve both gas and oil as it has done at Ventura and greatly reduce storage requirements for oil above ground.

The plan for conservation by storage is a rather elaborate one. It contemplates storage in the Meyer zone (an upper zone) from which some 30,000 barrels of oil per day is now being produced by 28 different operators some of whom have as many as a dozen different properties.

Briefly the plan provides for the formation of a non-profit association incorporated under the laws of the State of California, composed of all Meyer sand operators, the association to be known as Santa Fe Springs Gas Conservation Association. It is proposed that this association take over the business of repressuring the Meyer zone in all its details, operating under the direction of a board of directors elected by the association and a board of engineers appointed by the directors. The purposes of the association, as set forth in the by-laws, are:

" . . . . to effectuate injection and storing in the Meyer oil zone of the Santa Fe Springs oil district surplus gas produced from other zones in the same district and other districts, to the end that such gas may later be withdrawn and applied to beneficial use; that a greater, more economical and more orderly recovery of the oil and gasoline content of said Meyer zone may be had, and, further, to effectuate a fair apportionment among the parties entitled thereto of the oil, gas and gasoline which may be obtained and recovered from said Meyer zone."

Membership in the association is open to all Meyer sand operators, each member's interest being that proportion which his Meyer sand production, as determined over a 90-day average, bears to the total Meyer sand production determined for the same period. This interest once assigned remains fixed and determines the proportion which each member contributes to the investment fund of the association and its operating expenses as well as such member's proportion in the proceeds and such interest is not lessened by wells taken off production for injection or wells shut in to control gas distribution. A member's interest in gas and gasoline production is determined in the same manner.

Since such procedure affects royalty interests, the consent of the lessor is desirable as a prerequisite to membership and a form of agreement is provided between lessor and lessee. It is not believed, however, that failure of the lessor to agree will prevent the operation of the plan.

One of the most interesting as well as most radical steps provided for in the plan is the assigning to the engineering advisory board the duty of determining the proper operating control of production to be used by each member on his wells. This in effect places the entire pool under one management and is probably the greatest forward step in cooperative operation so far contemplated.

If when the proposed plan is put into effect, increased production results, as is expected, operators in the higher structural parts of the field will produce more oil than they are entitled to by their respective interests, while operators in the lower portions of the field will receive less. It is not planned to have the association physically handle and market such production but to act as a clearing house for adjusting the differences either in cash returns or in kind through credits and debits from the pipe line companies.

It is unfortunate that this experiment in cooperative conservation will have to be carried out in a town lot field. It would be much better to try it in a field where only a few of the major companies were involved, so that the plan could be perfected in the light of actual practice and results obtained before so many diverse interests were introduced, but the exigencies of the situation prevent this "preview." If it succeeds, it will mark a most important step forward in cooperative operation of oil and gas production. If it fails we will try again.

Production Curtailment in Texas

(Continued from page 57)

field have been defined as yet but the apparent oil reserve is enormous.

The flush producing areas in West Texas probably could underbid and undersell any other producing district in America, North or South. They have no incentive, however, to market their "one-time crop" at bankrupt prices. Their proper portion of the total consumptive demand is not an agitated issue. They merely expect a sufficient outlet for their production to produce a living income. The writer has no interest in nor connection with any company or property in West Texas but has been close enough to the curtailment effort in Texas to understand the mood of the operators.

The opinion is widely held that, whatever production West Texas is capable of making, the current output represents all the oil that can be moved from there. This idea is erroneous, since about 100,000 barrels per day could be moved out of West Texas with the present facilities. The trunk pipe line outlet last summer was 225,000 barrels. An additional 125,000 barrels daily is already assured before next summer and any further disparity in the posted price for this crude as against any other competitive crude will encourage the construction of additional pipe lines. These lines when built will certainly be utilized and that much additional output will demand a market or will supplant a market now being supplied elsewhere. Far from feeling that the stability of West Texas production is assured, the writer believes that the demand for that oil at the present crude price levels or ratios is the most serious threat to the maintenance of proration in Texas.

Conclusions

Proration in Texas was dictated by necessity; it was worked out by expediency. Great benefit has resulted to the industry; certain hardships have been borne by some operators. Much has been accomplished in the past; still more must be undertaken in the future. Advanced to its logical conclusion, there must be a proration as between prorated areas. The consumptive demand must be shared. This is not a problem for Texas alone. It involves the entire United States and finally the whole world. A more general understanding of the true situation in Texas should force these greater considerations. Texas could ship an additional 100,000 barrels daily beginning tomorrow, by next spring perhaps another 100,000 barrels and by the end of next year possibly still another. So much is dependent upon proration that perhaps it should be defined.

Proration is an artificial device resorted to when unusual conditions prevent the natural, customary methods of oil production. Primarily it must be legal; ultimately it should be fair and reasonable. It may be postulated that the most equitable basis of proration will effect a withdrawal of oil relatively comparable in

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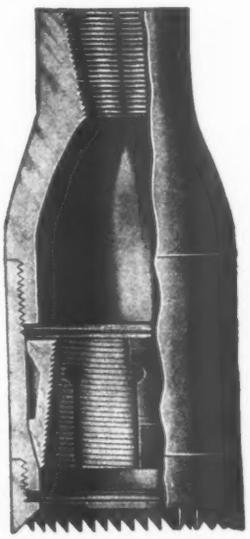

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amount to what would have taken place if no restrictions had been necessary. In other words, only the time element should be altered. In this way the volume of production can be adjusted to the volume of consumption and the output will thus keep in step with demand.

Such a basis of proration can be predicated neither on the size nor location of lease tracts, nor on the potential production indicated by initial gauges, nor upon natural flow restricted to obtain any arbitrarily selected gas-oil ratio. It should be pointed toward permitting withdrawals which would finally effect the same ultimate recovery from each tract that would have resulted from the free and untrammeled development of the fiield.

Obviously, if the exact amount of oil underlying any given lease tract could be computed in advance of development, it would be a simple matter to arrange crude withdrawals which would finally result in approximating such yields. On the contrary, no one would attempt to make such estimates and therefore the accepted version of fairness under proration hangs upon the ideas and opinions of technologists as to what extent such artificial regulations will have altered normal results. The truth can never be known and any acceptable formula, therefore, must be the result of compromise. For this reason it seems more desirable to develop a method of proration as a result of mutual agreement by the operators concerned in any particular field than as a result of fixed governmental regulation.

The experience in Texas and also in Oklahoma during the past year, however, has shown that in most cases the majority of operators in any area could agree upon a satisfactory plan. Such a majority, however, has had no power to place their regulations in effect and a minority of only one was therefore sufficient to prevent the adoption of a program which appeared to offer the greatest good to the greatest number. For this reason it seems desirable that such authority in each state be vested in some conservation commission, or other regulatory body. The writer offers the further thought that such a body should have no power to initiate such regulations, but rather, after receiving applications from the majority of operators, to promulgate certain rules and after conducting hearings to establish the necessity and fairness of such regulations, they should be enabled to administer and enforce the program recommended.

Collett Quits as Winkler Proration Chairman

Fort Worth, Texas.—J. D. Collett, Fort Worth operator, tendered his resignation as chairman of the Winkler County proration advisory committee at a special meeting held here November 27, and the body elected Ed. A. Landreth, president of the Landreth Production Corporation, Fort Worth, to take over the duties of chairman. Mr. Collett has been an outstanding worker in ironing out the numerous problems that have arisen since proration was ordered in Winkler County by the Texas Railroad Commission effective May 5, 1928, and has maintained daily contact with the proration staff in the field in order that the plan might be successful. Relief from these duties to devote more time to his private business affairs was the reason given by Mr. Collett for resigning, while assurances were given the committee that his services would be available in the future on important matters, if needed.

Mr. Collett has given liberally his time and personal efforts during the past eight years or more to problems confronting the oil industry in Texas, and was elected president of the Texas division of the Mid-Continent Oil & Gas Association for five consecutive times.

Personal Mention

Ben M. Bell, vice-president of the Pandem Oil Corporation, has succeeded A. B. Smith, who resigned as president recently to become president of the Petro Royalty Corporation. Mr. Bell will continue to maintain headquarters at Wichita Falls, Texas, while Mr. Smith goes to New York City in connection with his new duties.

Walter R. Berger, formerly chief geologist in the Texas division of the Marland Production Company, is now in charge of the Marland Employees Royalty Company's geological department in Texas and New Mexico, with headquarters at Fort Worth.

Frank T. Pickrell, vice-president and general manager of the Texon Oil & Land Company, with headquarters at Fort Worth, departed last week for a business trip to New York City.

D. O. Bayless, superintendent land department for The Texas Company in the Central Texas division, with headquarters at Fort Worth, departed last week for Denver, Colorado, on a short business trip.

Lon D. Cartwright, Jr., formerly in charge of the subsurface laboratory of the California Company at Colorado, Texas, has resigned to accept a position on the geological staff of the Superior Oil Company of California, with offices at Carlsbad, New Mexico.

Jack Ballagh, secretary of Patterson-Ballagh Corporation, Los Angeles headquarters, is preparing for a field trip through Mid-Continent territory following the American Petroleum Institute meeting in Chicago, which he is attending. He recently completed a business tour through Mid-Continent fields en route to New York, and plans returning to the Pacific Coast just prior to Christmas.

Tulsa Exposition Will Be Held in 1929

Tulsa.—The sixth International Petroleum Exposition and Congress will be held in Tulsa in the Fall of 1929.

Announcement of the next oil show was made by William G. Skelly, the president, following receipt of mail votes of some of the directors. Many directors, living out of Tulsa, could not be present for the meeting of November 8. They were asked to express their position by mail. The votes of these directors were in favor of the annual event to such an extent that the president made his announcement.

Date will not be announced until after the meeting of the American Petroleum Institute, now in session in Chicago.

The re-election of all officials also was announced by the president. In addition to Mr. Skelly, these officials are Alf G. Heggem and Frank Hinderliter, vice presidents; A. W. Leonard, treasurer, and William Holden, secretary. J. Burr Gibbons, who was general manager for the 1927 and 1928 expositions, is being urged to assume similar duties for the 1929 exposition. Following the 1928 exposition, he joined the Oil Well Improvements Company of Tulsa as vice president in charge of sales.

After the meeting of the American Petroleum Institute, the executive committee of the exposition will meet to determine dates and also to determine matters of policy and plans.

In announcing the 1928 exposition President Skelly called attention to the splendid reaction of exhibitors in regard to an annual affair. The majority of exhibitors expressed themselves as favorable and some desired to reserve space while the 1928 exposition was in progress. Expressions from exhibitors indicated that more space will be required for the 1929 exposition than for the one in 1928.

The International Petroleum Exposition and Congress in 1928, Mr. Skelly said, came into first rank as an outstanding international event. The affair had the indorsement and recognition of the United States Congress, the departments of State and Commerce, as well as the approval of practically all foreign nations having oil production. The many associations and organizations having connection with the petroleum industry also gave support to the exposition.

The exposition of 1928 drew 71 delegates from 21 foreign nations. There were 22 associations, government bureaus and research organizations with space in the educations and scientific building.

Indications are that the exposition plant will be enlarged for the 1929 show. The plant now consists of buildings and equipment, which cost $135,000. A site of 20 acres southeast of the city is owned by the exposition. In his report following the 1928 exposition, Mr. Gibbons made many recommendations for improvements to the plant. Many of these are to have the consideration of the directors and likely the majority of them will be carried out.

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Say you saw it in The OIL WEEKLY

Record Deep Well in Reagan County Flows Oil and Gas

Winkler County operators asking committee to increase prorated production to 175,000 barrels daily; more line space available

By H. H. KING
Staff Representative

SAN ANGELO, Texas.—Formal recommendations were made last week by the Winkler County proration advisory committee to the Texas Railroad Commission for the restoration of allowable production to 175,000 barrels daily. This increase of 25,000 barrels daily is to offset the inroads on the Hendrick field output by new wells in the O'Brien and Llano pools, while crude purchasing agencies have requested more oil for shipment from the county via pipe lines and tank cars. The Atlantic Pipe Line Company, which will begin operating a 10-inch line late this month to the Coast, is largely dependent upon Winkler County for a crude supply.

A special hearing may be called by the commission before acting on the advisory committee's recommendations.

Steady production performance of the wildcat oil strikes made recently in southeastern Ward County and northwestern Pecos County gives the West Texas district two new areas to develop during the coming year. Both wells are flowing by heads at regular intervals, and making oil of a much better gravity than the average found in the nearby counties.

The Pecos Valley Oil Company's Fee 1, Section 22, Block 10, Pecos County, is flowing 110 barrels of 37 gravity oil daily from sand at 1626 to 1628 feet, while J. F. Shiply and associates' Hayzlett 1, located about 12 miles to the north and in Ward County, is making about 120 barrels of 34 gravity clean oil daily from one foot of sandy lime pay at 2482 feet. New locations are scheduled to be made around these wildcat strikes shortly, while negotiations are pending for a pipe line outlet to supplement lease tankage now in use.

Deep Well Making Oil

Having passed up three producing horizons in making a world's record for total depth, the Texon Oil and Land Company's University 1-B, located in the Big Lake field, was making new history early this week by flowing 260 barrels of 44 gravity (corrected) oil, and six million cubic feet of gas during 24-hour gauge ending Tuesday morning, from sand and lime pay at 8500 to 8520 feet. This well is believed to be producing from the Pennsylvanian, and further drilling is impossible because of the gas flow. The last string of casing used consisted of five-inch cemented at 6184 feet, thus leaving 2336 feet of open hole. The drilling crew reported Tuesday that the well appeared to be drilling itself in, as a steady gain in oil and gas production has been registered within the past three days.

Winkler Potential Less

Potential production of Winkler County's 426 flowing and pumping oil wells was placed at 2,633,428 barrels on December 1, or 109,793 barrels less than the total reported by Umpire Reed Alsobrook at the beginning of the previous proration period. With allowable production limited to 150,000 barrels daily in the county during the next 15 days, the operators will be producing .0569 per cent. of their combined potential. The above figures include one well in the O'Brien pool and three in the Llano pool along with those in the Hendrick field, and the three separate areas are credited with a total of 198 40-acre units on production, or 7920 acres. The Southern Crude Oil Purchasing Company, R. A. Westbrook and Dixie Oil Company, operating jointly, lead on potential production, and have an allowance of 35,456 barrels daily from 110 wells on 64⅞ units. The wells in the O'Brien and Llano pools will receive 1835 barrels of the 150,000 barrels production allotted the county.

The Yates field was credited with a potential production of 4,210,315 barrels daily on December 1, with 152.9 units of 100 acres each on production, and the joint properties of Mid-Kansas Oil & Gas Company and Transcontinental Oil Company will receive 33,477 barrels of the 72,500 barrels daily allowable production. The latter concerns completed their I. G. Yates 11-C, Section 60, just in time to qualify for the new proration period, but a gauge of the flow had not been made when the above figures were compiled. This well logged the oil and gas pay at 1120-75 feet, and is credited with having flowed 194 barrels of pipe line oil through two four-inch lines with 270 pounds back pressure during a five-minute test, but will install three six-inch flow lines and a battery of 12 500-barrel steel tanks to make the proration gauge. It is expected to outstrip the record set up last September by their Yates 5-D, which flowed 6096.6 barrels per hour, or at the rate of 146,318.4 barrels per day.

Gulf Production Company started rigging up on three offsets to the Keck Investment Company's McClintic 1, which widened the Gulf-McElroy field to the south last week about one mile swabbing 120 barrels of oil on 12-hour test after shot of 400 quarts in lime at 2873-2934 feet, and other locations are in prospect for this section of Crane County. Gulf Production Company is also starting another test on its W. N. Waddell block in Crane County, where two small producers have been completed, having made location at the center of the NW NE of Section 12, Block B-25, for Waddell 6. Gulf Pipe Line Company is building a four-inch line from this pool to tap a line owned by Humble Pipe Line Company in order to market the production which has been stored at the lease heretofore.

Amerada Petroleum Corporation's Daugherty 1, which was listed last week as an extension to the Llano pool, North Winkler County, gauged 159 barrels of fluid, including 39 per cent. b. s. and water, per hour on proration test at a total depth of 3152 feet, and was credited with a potential flow of 2328 barrels daily. This well will be allowed to produce 445 barrels daily during the first 15 days in December, and Humble Pipe Line Company is running the oil as treated for purchase.

Big Lake, Texas.—Having surpassed the previous records for the deepest drilled holes in the world by a margin of about 500 feet, the Texon Oil & Land Company's University 1-B, located amidst producing wells in the Big Lake field, gained another record during the past week when both oil and gas production was encountered near the 8500-foot level while carrying some oil from the third pay horizon at 6284-6299 feet. This well flowed 78 barrels of 44.7 gravity (corrected) oil and 2,900,000 cubic feet of gas Sunday when deepened to 8520 feet, and drilling could not be continued owing to the gas pressure. The gravity of the oil from the new pay is about three degrees higher than that in the third pay, and about eight degrees higher than the oil produced from the two regular lime horizons at 2400 and 2900-foot levels. The gas produced from the lower pay shows a recovery of 1.2 gallons of natural gasoline per thousand.

This deep producer has been drilled with cable tools, and changed to electric motor for drilling power at 6573 feet. The well is cased with a string of 5 3-16-inch pipe cemented at 6184 feet, and has been making from four to eight feet of hole daily while drilling below the 8000-foot level.

The fourth oil and gas producing horizon was encountered in dark sand at 8496 feet followed by streaks of hard

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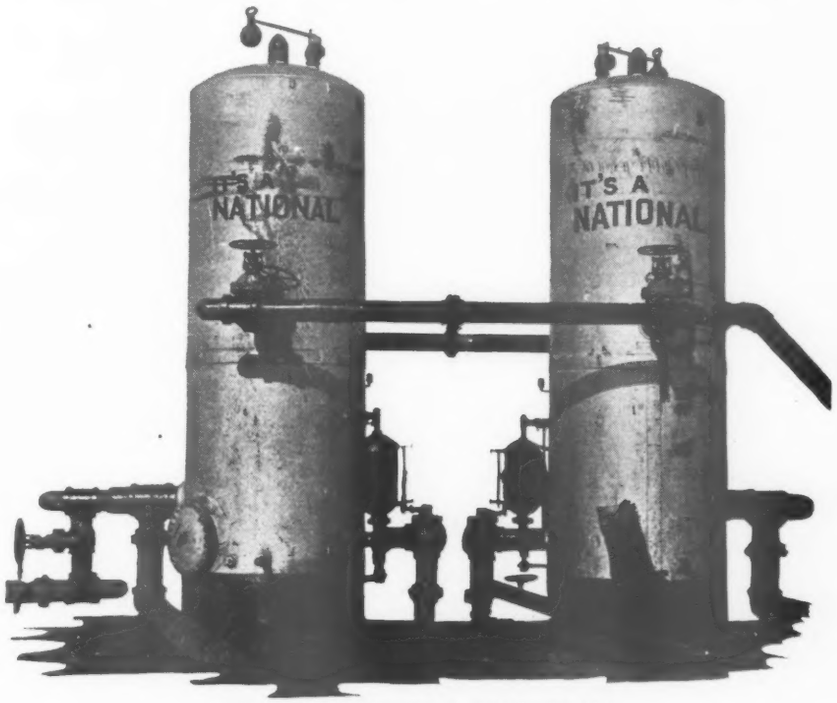

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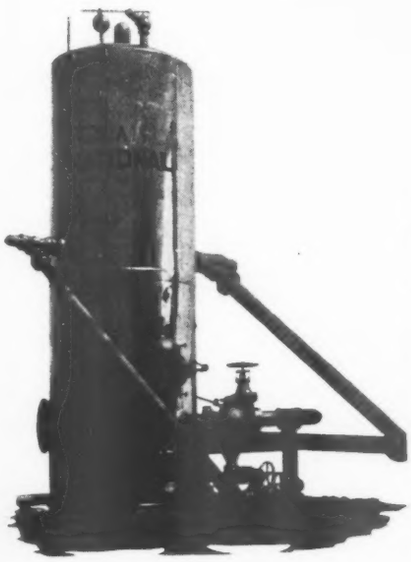

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brown lime and gray sandy lime, with a substantial increase in gas production at 8516 feet. The well flowed 7½ barrels of oil on the morning of November 29 while in hard black lime at 8518 feet, and made another flow of 18¾ barrels December 1. The increased output of gas appeared Sunday while drilling in hard black lime and shell at 8520 feet, as the well had previously gauged 86,000 cubic feet of gas. This deep oil production is sweet, while that produced from regular pays in the field carry a high sulphur content.

According to Frank T. Pickrell, vice president and general manager of Texon Oil & Land Company, the total expense involved in drilling the world's deepest hole and prodcer is about $200,000, and the well will be carried to a greater depth if the gas pressure can be overcome.

Million Barrel Concrete Tank Springs Leak

McCamey, Texas.—Shell Petroleum Corporation's one million barrel concrete crude reservoir located near McCamey and filled about 50 per cent capacity with West Texas crude, developed a leak early last week, resulting in a loss of more than 50,000 barrels of oil. The loss was held down by pumping water into the tank, while in the mean time immediate steps were taken to remove the oil to other storage. Shell Petroleum Corporation has a similar sized tank in service at Monahans, Ward County, and has experienced no loss through leakage, although the tank is filled.

Prairie Shareholders Get Stock Dividend

—Independence, Kansas.—Stockholders of the Prairie Pipe Line Company will meet January 4, 1929, to vote on the proposed changes in the value of shares in the concern and certain other matters regarding finances of the company. The changes include reduction of the par value of shares from $100 to $25 each, increasing the number of shares of stock to 4,050,000, issuing each present holder of a $100 share, four shares of the $25 stock and as as a stock dividend an additional share of $25 stock.

If carried by stockholders, each of the present $100 shares of stock will bring five shares of the $25 stock, and will be issuable to stockholders of record as of the close of business January 8, 1929.

Application will be made to list the new stock of the Prairie Pipe Line Company on the New York Stock Exchange.

This proposed changing in par value of the stock, comes shortly after the purchase of the Rockefeller holding in the company by a syndicate, headed by Blair & Company. The banking group has bought 11 per cent. of the stock of the company and 14 per cent. of the shares. This stock was held by the General Education Board, the Laura Spellman Rockefeller Memorial and the Rockefeller Institute for Medical Research.

Rising Light Oil Production Checks Further Market Improvement

(Continued from page 42)

immediately on a 2500 barrel daily capacity plant at Del Rio, Texas, having contracted for a crude supply from the Yates field. This crude will be furnished by Mid-Kansas Oil & Gas Company, and delivered direct to the plant via the Illinois Pipe Line Company's system. The Amarillo Producers and Refiners Corporation plans to start construction work shortly on a 2500 barrel skimming plant at Kermit, located near the Hendrick field, according to J. D. Wrather, president, or will double the capacity of its Pyote plant by installing the above unit. The Del Rio plant has obtained a fuel oil contract from the Southern Pacific Railroad, which has also been buying a large quantity of fuel oil on contract from Humble Oil & Refining Company's McCamey plant.

A major company is reported to be planning to erect a refinery at Sweetwater, Texas, shortly, and will use West Texas low gravity crudes. The Texas Company is at work on erecting skimming plants at San Antonio and El Paso, Texas, both to operate on West Texas crudes.

A formal request was made last week by the proration advisory committee of the Winkler County area, West Texas district, to the Texas Railroad Commission to boost the allowable production from 150,000 to 175,000 barrels daily about January 1. The latter allowance was in effect from June 16 to October 1, and the 25,000 barrel reduction was made because of inadequate market outlet. The completion of the Atlantic Pipe Line Company's 10-inch trunk line to the Gulf Coast late this month will materially increase the market outlet for Winker County, and other pipe line companies have made a bid for an increased quota of crude. The granting of a larger output for Winkler County is expected to be followed by a similar demand from operators in the Yates field, where potential production is nearly twice as large as that credited to the Winkler County area's three pools.

Softer quotations on gasoline in the North Texas refining district were in evidence over the past week, and prices on U. S. motor gasoline varied from 8 to 8¼ cents per gallon, with comparatively little buying activity. Fuel oil prices in this district continue weak, with a heavy supply on hand, while prices on average grades range from 50 to 55 cents per barrel.

California

Production from the deep sand at Santa Fe Springs has passed 50,000 barrels, and with more than 200 wells drilling only a lack of uniformity in sand conditions can prevent a much larger production before the first of the year. A ray of hope is seen with the discovery of bottom water in the Buckbee zone, but the intermediate zone may more than offset this condition. Two distinct zones are producing, where only one was expected to be productive. A production of more than 100,000 barrels is expected by January 1. Conservation still is a vital topic and the actual curtailment of production seems possible. Smaller operators are anxious to obtain a maximum production in the shortest possibe time, due to unusually heavy losses in the development of the upper sands, but they are gradually yielding to pressure to reduce runs as production reaches a dangerous figure. The surplus gas will be saved by the pinching in of wells, according to the present plan for conservation. The light oil market is beginning to feel the effects of the increase in production and premiums in other fields are about eliminated, except where contracts call for a price above the posted field price.

Long Beach has shown a gain in production for two straight weeks, but the reversal in form is regarded as only temporary. Several good wells have been completed in parts of the field which have yielded good producers all along. Any increase in production weakens the crude market to that extent, and with other fields nearby gaining rapidly, an increase is felt more sharply than if only one area had to be considered.

No immediate trouble is anticipated from new fields in the northern part of the state, although they loom as market factors. Elwood is fast coming to the front and a production of 50,000 barrels is expected. Kettleman Hills offers much promise but production is obtained at such great depths that at least six months will be required to drill additional wells.

The increase in light oil production is expected to give a slightly weaker tone to the gasoline market. Independent refiners and jobbers are beginning to obtain a better supply of crude and reduced retail prices may be expected to some extent.

Geologists Planning For Fort Worth Session

Tulsa.—The executive committee of the American Association of Petroleum Geologists met in Tulsa Wednesday to transact official business and make some preliminary plans for their convention to be held in Fort Worth in March. R. S. McFarland, president of the association, presided. This association has experienced a large increase in its membership. It now has more than 2300 members in 47 states and 29 foreign countries, according to McFarland.

Gilbert J. Sevier, scout for the Pure Oil Company in the Texas Panhandle district, has been transferred to Lockhart, Texas, to cover the field developments in Caldwell, Bastrop and nearby counties.

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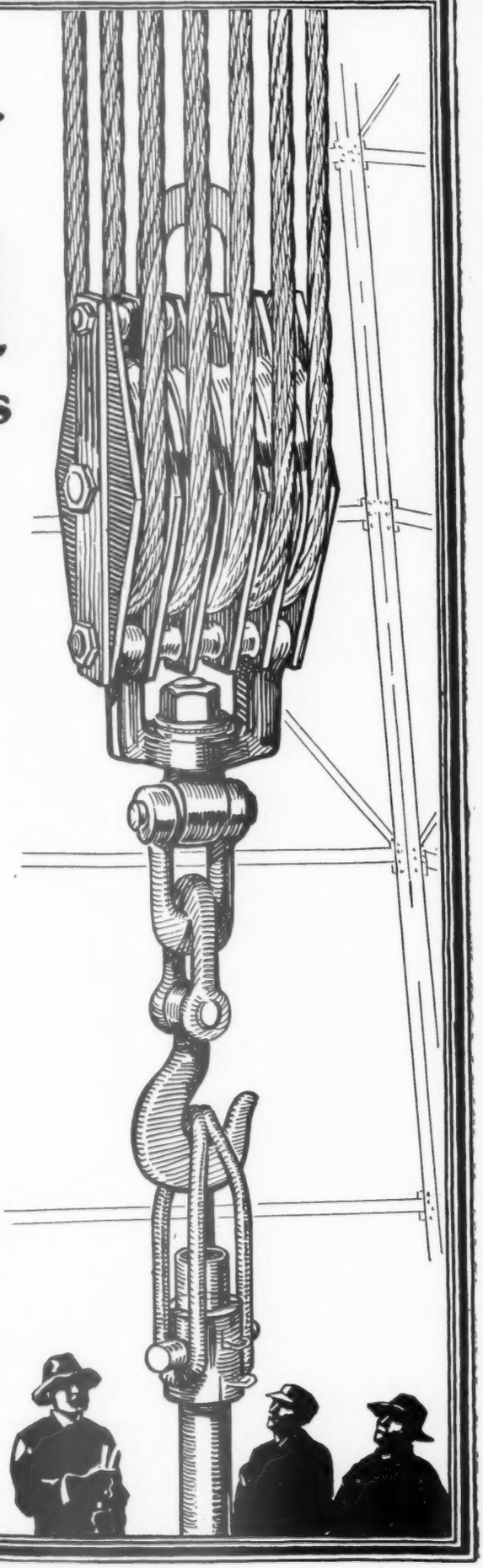


Say you saw it in The OIL WEEKLY

Oklahoma City Wildcat Flowing 1,200 Barrels Oil

Most important wildcat strike of year is 40 miles from Seminole and should start play in that direction; big acreage controlled around well

By WARREN BAKER
Staff Representative

TULSA.—Indications are that the Indian Territory Illuminating Oil Company and Foster Petroleum Company have found commercial oil production in the Oklahoma City 1, C SE SE Section 24-11-3w, six miles south of Oklahoma City. This constituted the outstanding field development of the week in Oklahoma. The well drilled out the cement plug late last week, with the result that gas found beneath blew the tools up in the hole and caused a bridge. The well evidently has considerable gas, since the bridge rose from 6200 feet to 2500 feet where it is holding fast.

Three bailers of oil have seeped through the bridge. This oil tested 39 gravity Baume at a temperature of 70 degrees. General opinion of those at the well is that the hole beneath the bridge is full of oil, because of the seeping through of the oil, and if it were gas the bridge would have been blown out.

Efforts are now being made to fish out the tools, preparatory to knocking out the bridge. This was expected to be accomplished at most any time. Oil men are anxiously awaiting the completion of the fishing job because of the great importance of the well.

The well first attracted state-wide attention when it found commercial gas production at 3990 feet. Since that time it has been the center of much interest. It drew much attention because it was running high and considered a probable producer. Without a doubt it is the most important wildcat test in Oklahoma today. The promising test is located 40 miles northwest of the Greater Seminole district, and is productive, will mean a rapid spread of the Seminole play in that direction.

During the past two years major companies have been actively soliciting blocks in western Oklahoma. This well means much to that play, as it shows that production is carried in that direction, despite the dipping of formations to the west. It will call for additional tests in the vicinity of Oklahoma City, regardless of its final outcome. A competitive campaign, should it be highly productive, is unlikely, since Indian Territory Illuminating Oil Company and Foster Petroleum Company control most of the acreage and plan to hold drilling to a minimum.

New St. Louis Pool to Be Small

It appears that the producing area of the new Wilcox sand pool on the west side of the St. Louis field will cover only a small amount of territory. Water is making inroads on production, although only a few wells have been completed. Several unsatisfactory completions have been made.

Tulsa, Okla.—Indian Territory Illuminating Oil and Foster Petroleum Company's Oklahoma City 1, C SE SE Section 24-11-3w, six miles south of Oklahoma City, fished out the tools at 3 o'clock Tuesday afternoon, and immediately began flowing between 50 and 75 barrels per hour. This is the first big well in the Oklahoma City area, and opens a new rank wildcat producing pool 40 miles from Greater Seminole. Total depth is 6,402 feet.

Mid-Kansas Oil & Gas Company defined the producing area to the south with its Getzelman 3, SWc NW Section 25-7-4, one-quarter of a mile from the discovery producer. This well was deepened to 4415 feet in Wilcox sand found at 4395 feet and filled up with water. It is being plugged back to the Simpson sand. Magnolia Petroleum Company's Cherry 1-A, NE SE NE Section 26-7-4, southwest diagonal offset to the initial well, also puts a damper on the outlook in a southern direction. This well is now on air pressure, and doing 4495 barrels but is also cutting 10 per cent. The cutting, so far, does not seem to have injured its producing ability, but it is not expected to hold up to its big recovery.

Shaffer Oil & Refining Company's Cherry 3, SWc SE SE Section 23-7-4, carried the producing area of the Wilcox sand nearly one-half mile northwest. This well came in for 65 barrels per hour, but soon started cutting five per cent. Cherry 4, east offset to No. 3, found a hole full of water in the Wilcox sand. This was unexpected, because it is directly between two producers.

Sinclair Oil & Gas Company's Blandin 13, SWc 24-7-4, one-quarter mile north of the original Wilcox sand well, was deepened to 4227 feet and flowed better than 12 barrels per hour. It is cutting one per cent. Blandin 12, east offset to No. 13, is on air pressure and doing around 2000 feet. No water is reported on this well.

Production is not expected to go far north of these wells, because of the appearance of water. This leaves a straight west direction and a southeast direction open, however, neither of them are particularly attractive. It will require some time to develop the territory to the west, as none of the wells in that direction are yet to the Hunton lime, with a very few exceptions.

The next test of great importance to the new field to be completed should be the Prairie Oil & Gas Company's test in Section 27-7-4, one mile from production. This well has topped the Simpson sand at 4193 feet, where it is fishing. It has a small show of oil.

In the meantime, a very encouraging feature is the fine fashion in which The Texas Company-Fuhrman Petroleum Company's Cherry 1, SWc NW NW Section 25-7-4, discovery well, is holding its production. The well is doing an average of 3330 barrels daily. Pure Oil Company's Thomas 1, SE NE NE Section 26-7-4, west offset, is making 3535 barrels while agitating. Neither well is cutting.

Pool East of Little River Disappointing

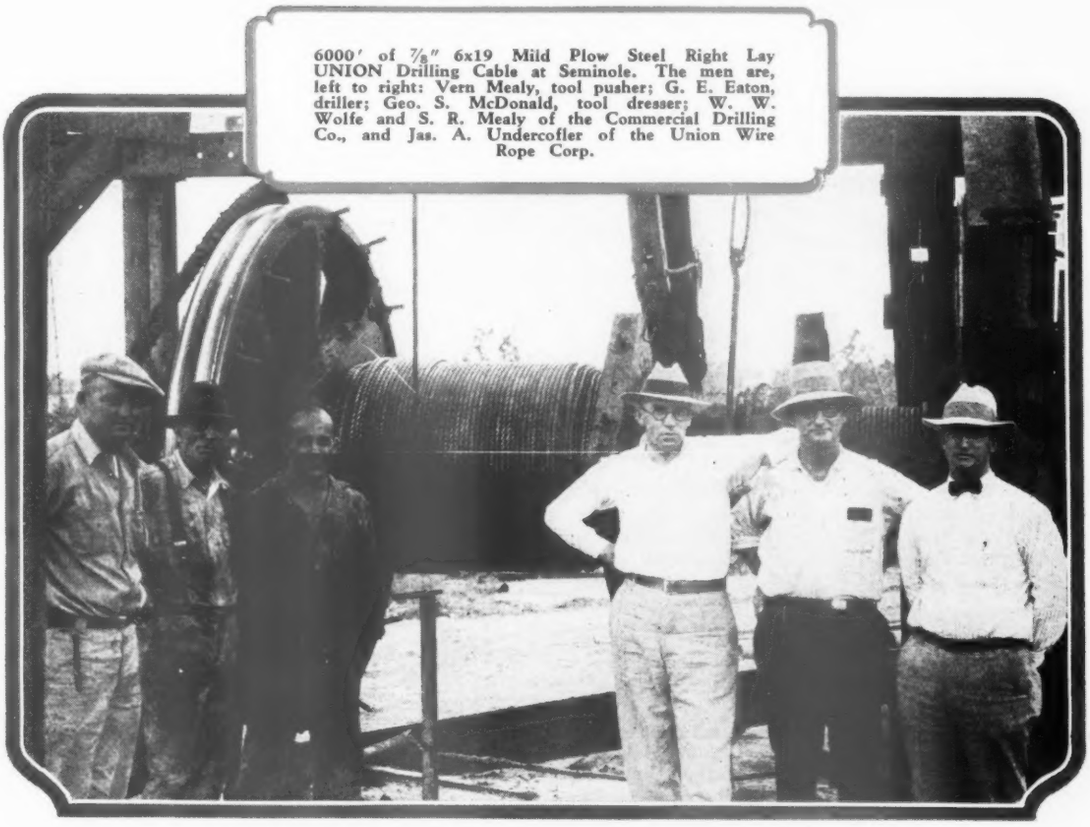
The pool east of Little River, which was opened by Mid-Continent Petroleum Corporation's Smith 1, NWc NE NE Section 5-7-7, is fast being defined. About the only direction not defined is straight to the south and no tests are drilling in this direction. The best completion, in addition to the discovery well which continues to do more than 3000 barrels, is Mid-Continent Petroleum Corporation's Smith 2, east offset. It is swabbing slightly less than 500 barrels daily from the Wilcox sand at 4486-91 feet.

Maud District Interesting

Interest in the Maud district is now centering around the Amerada Petroleum Corporation's Gossland 1, NEc SW Section 8-8-5, which is drilling to the Wilcox sand. It is drilling at 4132 feet in the Sylvan shale, and producing around 650 barrels from the Misener and Hunton pays through a bradenhead. The well is generally thought to have a good opportunity of producing in the Wilcox sand, unless the lower formations thicken. It is west of the present Wilcox sand production at Maud.

The intervening area between the Gypsy Oil Company's Bourassa 1, Section 7-8-5, Maud pool, and the Pure Oil Company's Lindley 1, Section 18-8-5, two wildcat discovery well in the western part of the district, was practically proven productive when the Independent Oil & Gas Company's Harding 1, SEc SW Section 18-8-5, did 410 barrels the first 13 hours from Misener sand at 4169-70 feet. Pure Oil Company opened up Lindley 1, during the week and it did better than 2300 barrels in 24 hours. Gypsy Oil Company's Bourassa 1, remains pinched in entirely.

Prairie Oil & Gas Company's Campbell 1, Section 18-8-5, one-quarter of a mile



6000′ of 7/8″ 6x19 Mild Plow Steel Right Lay UNION Drilling Cable at Seminole. The men are, left to right: Vern Mealy, tool pusher; G. E. Eaton, driller; Geo. S. McDonald, tool dresser; W. W. Wolfe and S. R. Mealy of the Commercial Drilling Co., and Jas. A. Undercofler of the Union Wire Rope Corp.

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UNION WIRE LINES

Say you saw it in The OIL WEEKLY

west of the Pure Oil Company's Lindley 1, continues to do 100 barrels of oil and two barrels of water daily on the swab. Several other wells in this district are ready to drill in, and they will tell more about the potential production possibilities of this shallow area in western Maud.

McCully Pool Extended to North

Sinclair Oil & Gas Company's Webber 2, NEc SE SE Section 18-19-4w, one location north of production in the McCully pool of Logan County, had an initial production of 3287 barrels. This is the biggest well yet completed in the McCully pool. Wilcox sand on the well was 6095-6125 feet. Production has dropped off to 2450 barrels, which is around the average initial production in the pool.

Champlin Refining Company's wildcat in Section 14-7-5, east of the St. Louis pool, penetrated the Simpson sand at 4253 feet and at only three feet in had filled up 2500 feet with water. The well is about two miles northeast of production.

Superior Oil Company's important wildcat in Section 24-8-2e near Macomb, 12 miles northwest of the St. Louis field, is still fishing for the eight joints of casing dropped in the hole about 10 days ago. This well has found a good showing of oil in the Hunton lime through rotary mud and is shut down to run pipe and test. Considerable interest is being displayed in its possibilities of producing, which has resulted in some trading of leases and royaltes.

T. B. Slick's test in Section 24-5n-7e, southwestern edge of the Allen field, is drilling around 3600 feet. It has passed through the Cromwell sand where the Sunray Oil Company's Jonana 1, north offset, found big gas production. Reports were general in Tulsa last week that the test was going to the Wilcox sand, which brought operators face to face with the probability of the Allen pool shutdown blowing up should it produce, however, this was relieved when Slick's Tulsa office denied the well was to be drilled to the Wilcox sand at the present time.

Sedgwick County Well Flows 5000-7000 Barrels

Tulsa.—Marland Production Company's Goodrich, center of the southwest of Section 16-25-1e, north of Wichita, Sedgwick County, Kansas, is now shut in after flowing wild at a rate estimated from 5000 to 7000 barrels daily. Marland Production Company owns 100 per cent. 3560 acres surrounding the new wildcat producer.

T. B. Slick's test in Section 24-5n-7e, approximately two and one-half miles southwest of the Sinclair Oil & Gas Company's Wilcox sand discovery well in Section 7-5n-8e, Allen field, has topped the Mayes formation at 3634 feet, which is but nine feet lower than on the Sinclair well. If lower formations do not thicken, this well may find production in the Wilcox sand, thus opening a tremendous area for development. Pipe is being set at 3640 feet.

Seminole Production

Tulsa.—Greater Seminole crude oil production for 24 hours ending 7 a. m. Tuesday was 281,630 barrels from 1282 wells divided as follows:

Littleriver, 308 wells, 95,286 barrels;
Maud, 9 wells, 9103 barrels;
Missions, 12 wells, 1102 barrels;
Bowlegs, 312 wells, 47,734 barrels;
Earlsboro, 289 wells, 77,127 barrels;
Seminole proper, 286 wells, 40,974 barrels;
Searight, 67 wells, 10,304 barrels.

St. Louis pool production was 131,650 barrels from 261 wells for 24 hours ending 7 a. m. Teusday.

Magnolia Line Serving Bastrop Wildcat

Houston.—Magnolia Pipe Line Company last week completed and began operating its eight mile four-inch line from the recently completed Bastrop County wildcat well, Andy Yost 1, of Cranfill & Reynolds and A. M. Loomis, to the Magnolia line at Lytton Springs. Magnolia has classified this oil with Luling production, paying $1 per barrel.

Yost 1, which opened what is known as the Cedar Creek field, is now pumping about 175 barrels daily, 10 per cent. water; the production being from 118 feet of serpentine topped at 1480 feet. It seems that water has put in its appearance rather early.

The owners of the discovery well were drilling early this week at 650 feet in Yost 2, and the Yost 3 was rigging up. Amerada Petroleum Corporation, drilling an offset to the discovery well, is expected to make a producer of Yost 1, which is an interesting test as it has penetrated the serpentine consideraby more than it was drilled in the discovery well.

Boggy Creek Extension Boosts Production

Houston.—Production at Boggy Creek, Anderson-Cherokee Counties, East Texas, which had been averaging around 1700 barrels per day, was materially increased when the Humble Oil & Refining Company last Saturday brought in A. E. Todd A-1, as a three-quarters of a mile southwest extension of the field. The well logged sand pay at 3706-36 feet, and flowed 1668 barrels of 40.6 degrees gravity oil at 66 degrees temperature in 17 hours through a five-eights inch choke, together with estimated 1,288,000 cubic feet of gas. Gauged again the next day, the well flowed 113 barrels from 7 to 8 a. m., through a quarter-inch choke, registering 72 degrees temperature.

Following completion of this well, the Humble Pipe Line Company has put two pipe line crews to work in rushing the 74-mile eight-inch welded line from Groesbeck main line station and tank farm to the Boggy Creek tank farm, where four 55,000-barrel steel tanks are up. The survey for this line was made some time ago.

Humble Oil & Refining Company is now rigging up A. E. Todd B-1, located about 2100 feet northeast of the new producer, and about half way between the new producer and Roberts 1, which also came in as a good well, and was at the time of completion late in October the most southerly producing well of the field.

Humble Oil & Refining Company is the only operator in the Boggy Creek field. Its other drilling activity there now is as follows: in the south part of the field, Holloway 2 is drilling sand at 3915 feet; Lizzie Smith 2 is drilling at 3768 feet in shale; and W. T. Todd 1 is drilling at 482 feet. In the north part of the field, Weinberg 4 on the east side of the Neches River in Cherokee County, is rigging up; and Coleman 1, in Anderson County, is rigging up.

Houston.—Magnolia Pipe Line Company has plans for laying an eight-inch line from the Boggy Creek field, Anderson and Cherokee Counties, East Texas, to its main natural gas line leading out of North Louisiana and Northeast Texas to Beaumont and elsewhere in South Texas. The proposed Boggy Creek tap line would extend a distance of four miles, connecting with the main line at a point between Jacksonville and Palestine. The Boggy Creek field is owned and operated by the Humble Oil & Refining Company, and several large gas wells have been completed there. The line would take care of the field's gas production.

Bruner Field

Houston.—The latest and one of the best wells of the Bruner or Salt Flat field, near Luling, Caldwell County, is The Texas Company's Merriweather 2, which came in from the Austin chalk at 2555 feet, and made around 2000 barrels the first day, with the production pinched. A report this week showed the well making 1500 barrels of pipe line oil which tested 36.4 degrees, corrected; with a temperature of 74 degrees.

The Texas Company's Merriweather 1, tested dry in the Edwards lime at 2801 feet, and is drilling deeper.

Date Oil Company's Hickman 1 in this field has been abandoned at 2771 feet.

Average daily production of the Bruner field during the week ending December 1, according to American Petroleum Institute estimate, was 2300 barrels, as compared with 2000 barrels the previous week. There are over 50 rigs and locations in the field.

Houston.—Rycade Oil Corporation has moved its Houston offices from the Humble Building to the 11th floor of the Esperson Building; and the Vacuum Oil Company, which has its offices now on the 18th floor of the Esperson Building, plans to move next week to the sixth floor of the same building. The changes of both the Rycade and the Vacuum to new quarters are for the purpose of obtaining additional space.

—Oil Conservation~Tank Preservation—

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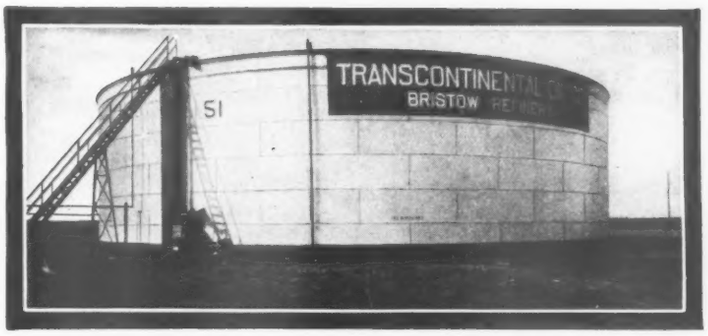

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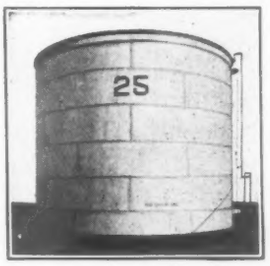

This silvery "coat-of-metal" also reflects the rays of the sun instead of absorbing them. Thus the tanks are kept several degrees cooler and oil evaporation is greatly reduced.

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Gulf Coast Field Development Notes

Old Hackberry Dome Gets Well

Houston.—Following years of unsuccessful drilling, the old Hackberry dome, Cameron Parish, Louisiana, has been opened for its first commercial production through completion by Cameron Oil Company and Rycade Oil Corporation of Duhon 2 on the south side of the dome. Reports in Houston Tuesday showed the well to be making around 400 barrels of oil per day, the production testing 22 degrees, corrected.

The oil is from 12 feet of sand bottomed at 3155 feet. The well came in on December 1. After being washed, it started flowing by heads; and earliest reports were that it was estimated to be making 200 barrels of fluid per day, including 80 per cent. wash water and 20 per cent. oil.

This well is about one-quarter mile northwest of the same owners' Duhon 1, abandoned some time ago as a dry hole at 4000 feet.

The old Hackberry dome has been known as a dome for years, and there has been considerable drilling on various sides of it. Among the more recent operations there have been those of the Yount-Lee Oil Company, on its School Lands and its State Black Lake leases on the north side of the dome. This company's School Land 7 was abandoned last spring at 5765 feet in heaving shale, and State 4 on the Black Lake lease was finally abandoned at 4897 feet following failure of a test at that depth of a sand showing heavy gas and some oil. After abandonment of School Land 7, Yount-Lee Oil Company withdrew from the area for the time being, concentrating operations on the East Hackberry dome, several miles to the east, where Calcasieu Oil Company and two associates, Magnolia Petroleum Company and Union Sulphur Company, had opened a new field on a geophysically outlined dome. The Yount-Lee Oil Company came back to the old Hackberry dome a short time ago, and is now drilling School Land 8 there; the latest report on the well showed it drilling hard sand at 3600 feet.

These tests of the Yount-Lee Oil Company are approximately two miles north of the new well of the Cameron Oil Company and Rycade Oil Corporation.

In addition to the School Land 8, one other test is now drilling at old Hackberry: Rycade Oil Corporation's No. 1 Yount-Lee (Gulf Land), which was drilling early this week in rock at 2640 feet.

The new East Hackberry or Kelso Bayou field, located on another dome, is about four miles east of the old Hackberry dome; and is now one of the most important fields in South Louisiana, particularly since it was extended to the east about one-half mile several weeks ago through completion by the Louisiana Land & Exploration Company of a 1500-barrel well out in Calcasieu Lake.

About half way between the new Cameron Oil Company-Rycade Oil Corporation well and the most westerly production in the East Hackberry field, C. O. Noble and associates, drilling on the eastern edge of the old Hackberry dome, attracted considerable interest to the Hackberry district last spring and summer through the showings encountered in their Ellender 1 and Ellender 2.

The Ellender 1 set casing over a sand showing oil and gas at 4350 feet, and about March 10, 1928, following bailing, made a head of 20 barrels of oil, 32 corrected gravity; but there was screen trouble, and although new screen was set, the well could not be completed as a producer. Deepened to 4490 feet, the well flowed by heads for a while, and promised to be a fair pumper; but it was finally abandoned without having yielded any commercial quantity of oil. The same owners subsequently drilled Ellender 2, but it was abandoned in heaving shale at 5080 feet.

Raccoon Bend Wild Gas Well Under Control

Houston.—Humble Oil & Refining Company and Valley Oil Corporation's Urban 2 at Raccoon Bend, Austin County, the test which had a gas blowout while drilling at 2327 feet, and which ran wild for nearly three weeks, blowing a large volume of gas through the casing and also around the outside of it, forming a crater, has been practically brought under control. A steel derrick, erected near the well, was skidded over the crater; and a string of 20-inch pipe was lowered down over the 13⅜-inch casing through which the gas was blowing. At the top of the 20-inch casing two Cameron Iron Works blowout preventers have been placed; and on Tuesday the gas was still being allowed to blow through them, but preparations were being made to run in drill pipe and try to mud up the well.

There is now considerable activity at Raccoon Bend. Hardy 1 the fore part of this week was drilling sand at 1018 feet; A. Grawunder C-1, Walton 2, and Grawunder B-1, were waiting for cement to set around casing at 1336, 1172, and 3257 feet respectively; Beal 1 was drilling shale and lime at 2864 feet; Bracey B-1 was at 3061 feet in sandy shale; and Urban 3 at 188 feet.

Houston.—Union Sulphur Company has completed its Fee 734 at Sulphur dome in Calcasieu Parish, Louisiana, boosting its production considerably there, where it is the sole operator. The well came in making 2000 barrels of pipe line oil, 21.5 gravity, at 4125 feet.

Fourth Well Completed On Sorrento Dome

Houston.—Gulf Refining Company of Louisiana early this week brought in United Lands Company 12 on the Sorrento dome, Ascension Parish, Louisiana, as the fourth producer of the field. Initial production was 1300 barrels, flowing from cap rock at 1650 feet. The Gulf Company has all land over the dome under lease.

This new well is the northernmost in the field, being 210 feet north of the discovery well, United Lands Company 4. All four producers are fairly close together. United Lands Company 6 is 250 feet east of No. 4; and No. 7 is 440 feet south of No. 4. Three wells, Nos. 7, 4, and 12, the new producer, are in a direct line. No. 1, which had a gas blowout and cratered, and Nos. 2 and 3, both failures, were in a line parallelling Nos. 12, 7, and 4, on the east of them. Nos. 5, 8 and 10, also failures, were located west of the producers.

The foot measurements of the new well, No. 12 are: 3300 feet east and 1210 feet north of the southwest corner of Section 15-10s-4e. Gulf now has a location for its No. 11, located 904 feet east and 850 feet north of the southwest corner of Section 15; it will be the most westerly test of all.

The Sorrento field created considerable interest when it came in early this year, inasmuch as it is the first productive salt dome field east of the Mississippi River.

For several weeks prior to completion of No. 12, the average daily production at Sorrento has been around 550 barrels from the three wells then producing.

Bayou Bouillon

Houston.—Rycade Oil Corporation, discoverer of the pay at Bayou Bouillon dome, St. Martin Parish, Louisiana, and sole operator there, late last week brought in Bayou Bouillon 4 in that field as a producer, flowing 20 gravity oil at the rate of 100 barrels per hour; but the well sanded up after flowing for four hours and is now being worked over.

Besides that new well, the company has three producing wells, all being on the pump. Atchafalaya Fee 2 and the State 2 are each pumping around 250 barrels a day, and State 1 is pumping about 100 barrels on the average.

Rycade Oil Corporation is operating four rigs in the field. Bayou Bouillon 5 early this week was drilling at 3635 feet in hard sand; Atchafalaya Fee 3, which had set casing at 3935 feet, with the bottom of the hole at 3957 feet, was bailing, with fluid standing 125 feet from the surface; Atchafalaya Fee 4 was drilling shale and lime at 3687 feet. In addition, Bayou Bouillon 6 is a derrick; and State 3 and Atchafalaya Fee 5 are locations.

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Space does not permit a description of the process itself. However, a descriptive bulletin covering the Electronic Tornado is available and will be sent on request.

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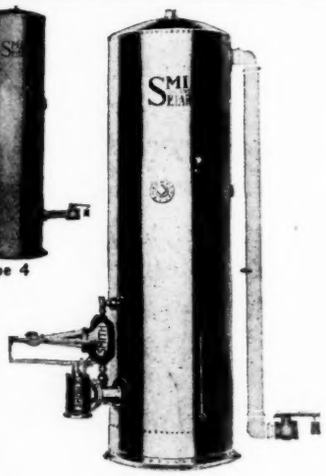

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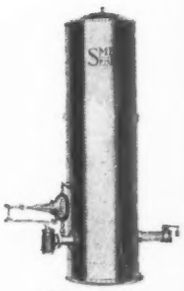

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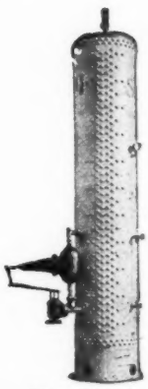

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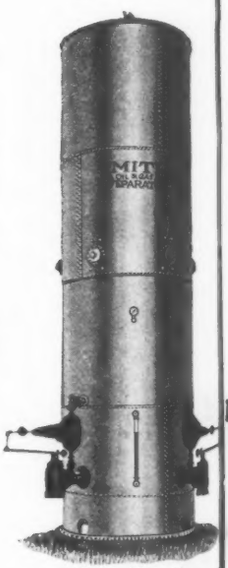

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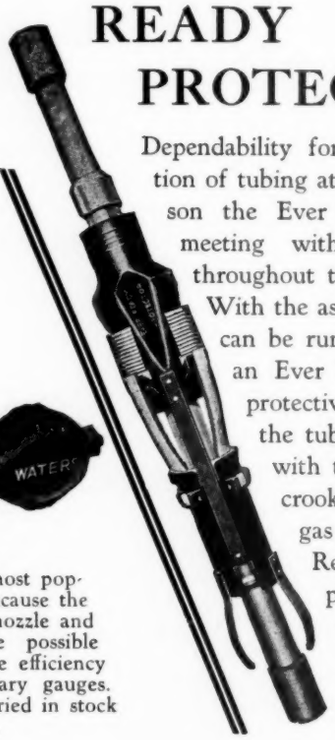

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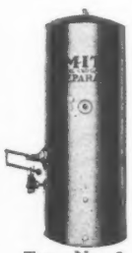

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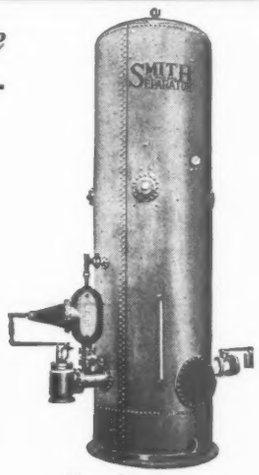

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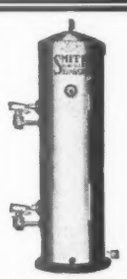

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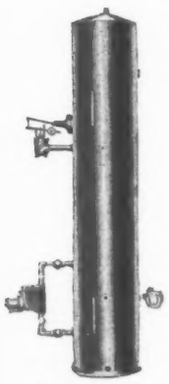

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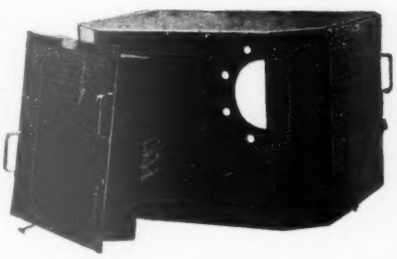

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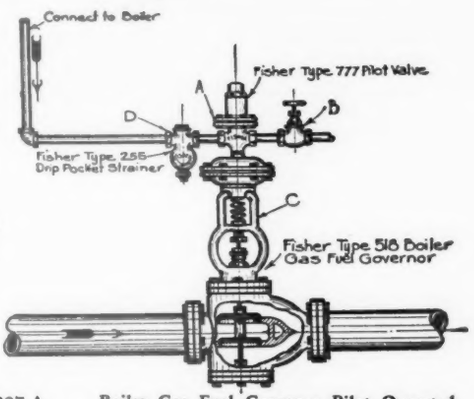

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THE NATURAL GAS INDUSTRY

Natural Gas Production and Utilization in California

"THE business of transmitting and distributing natural gas under conditions prevailing in southern California, presents a complex problem of supply and demand," writes A. F. Bridge, vice president of the Southern Counties Gas Company, in a recent issue of the report of operations of the California Division of Mines and Mining.

The supply of natural gas available to distributing companies in southern California, according to Mr. Bridges, varies over a wide range, the fluctuations being wholly unrelated to the market for gas. These fluctuations result from the discovery of new oil fields, the increase or decline of existing sources, the curtailment or shutting in of oil production, and changes in gas fuel requirements of oil operators for drilling, refining, etc., the latter uses having priority over gas sold to distributing companies. Natural gas as delivered to the gas companies in the field requires heavy investments in compressor equipment and pipe lines in order to transport it to markets which are often located at a considerable distance from the sources. For instance, to transport gas from the Ventura Avenue field to Los Angeles, a distance of about 75 miles, three field compressor stations and pipe lines have been constructed, with a total daily delivery capacity of 112,000,000 cubic feet, representing a combined investment of $5,400,000. At prevailing field and market prices for gas, the gas supply must have a life of at least five years in order to justify a pipe line project such as those mentioned.

There is now a considerable surplus of gas in the Ventura field above the combined pipe line capacity. This condition has existed for several months and would normally continue for two or three years longer, during the period of flush or peak production. At present there is no market for additional gas in southern California. However, even if a market were available, added transmission facilities to handle this surplus would fail to pay out by a wide margin. Thus, under the present system of unregulated gas production, it is economically impossible to provide transportation facilities equal to the peak production, even in the case of a conservatively drilled and long-lived field such as Ventura Avenue.

In a field where the leaseholds are large and the operators responsible, waste of gas may be minimized by cooperative drilling and producing agreements between producers. Much progress has recently been made in this direction. It is generally conceded, however, that in a town-lot field, and under our existing laws, control of production is not obtainable either by concerted action of producers or through regulation by public authority. The only method which has been at all successful under these conditions is the prorating of oil receipts by pipe line companies, where the latter are in position to restrict transportation of oil out of the field. Such conditions do not exist in most California fields. Obviously, in order to completely avoid gas wastage there must be either a continuous balance between production, transportation facilities and market, or storage must be provided sufficient to absorb the variations.

The extent of fluctuation in supply and its causes have been discussed, and it has been shown that the only remedy for peak period wastage is to flatten the peak, that is to shut in production and curtail drilling programs. We now come to a consideration of the variation in demand for gas and the possibilities of employing storage and other means to equate the load. The primary mission of a gas distributing company is to supply an adequate and uninterrupted service to its domestic customers, and most of its capital and operating organization are devoted to the rendering of this service. The demands for domestic gas vary over a wide range hourly, daily and seasonally. The seasonal fluctuation is almost entirely due to space heating requirements, which, of course, vary inversely with the temperature. The magnitude of this variation in domestic demand is indicated by the following typical ratios:

	Hour during 24 hr. Period	Day during One week	Day during One month	Day during One year	Month during One year
Ratio of maximum to minimum	28	1.9	2.9	5.6	3.1
Ratio of maximum to average	2	1.5	1.7	3.0	1.8

These relations are more clearly shown in the accompanying charts.

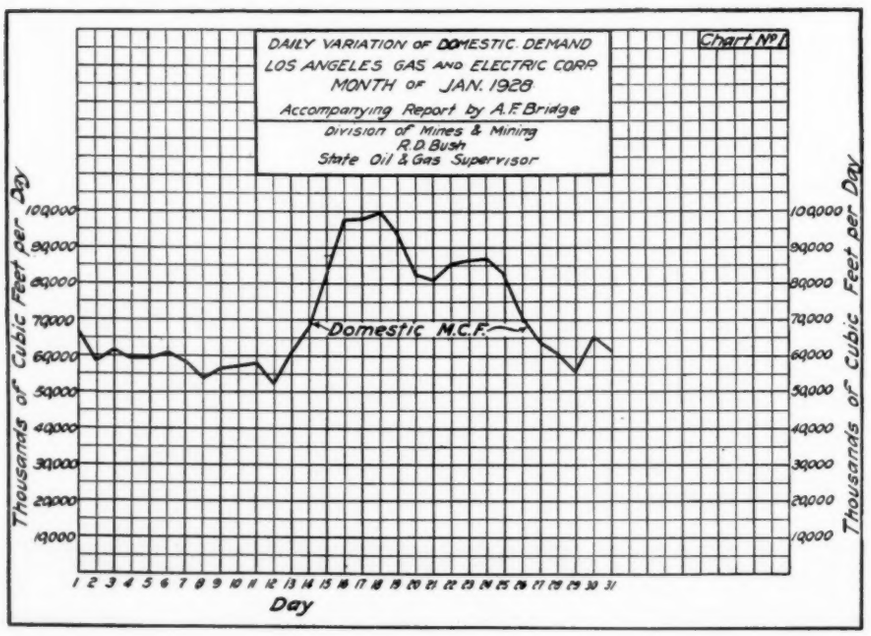
The layman frequently inquires why gas holders cannot be constructed to store the excess supply accumulating over a period of months or years, as is done with oil. This is an economic impossibility because the commodity is a gas and not a liquid. For example, the following table brings out some interesting comparisons between the cost of storing natural gas and oil:

Commodity	Volume unit	Nominal Value in field	Cost of storage per volume unit*	Ratio of storage cost to value of commodity
Natural gas	M cu ft.....	$0.10	$75.00	750.00
Crude oil	Barrel	1.00	0.35	0.29

*Holders and tanks of large size.

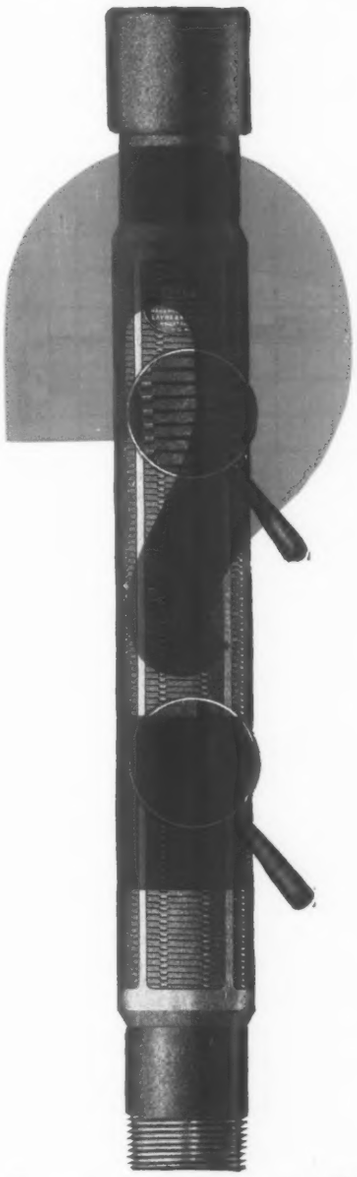
The use of underground storage, at best, offers only a partial solution of the conservation problem, since it cannot be made sufficiently flexible to absorb the daily fluctuations which occur within a week or two. In this connection it should be mentoined that the requirements of industrial consumers vary widely and unexpectedly. For example, in a period of four days during April 1928, the demand of a single industrial consumer dropped from 30,356,000 cubic feet to 5,164,000 cubic feet.

The most optimistic estimates of the input capacity of the fields suitable for in-


DAILY VARIATION OF DOMESTIC DEMAND
LOS ANGELES GAS AND ELECTRIC CORP.
MONTH OF JAN. 1928
Accompanying Report by A.F. Bridge
Division of Mines & Mining
R.D. Bush
State Oil & Gas Supervisor
Chart No. 1
Thousands of Cubic Feet per Day
Domestic M.C.F.
Day

What Do You Expect of Your Screen

Average Production
or
Super Production
Ordinary Strength
or
Super Strength
Average Life
or
Longer Life



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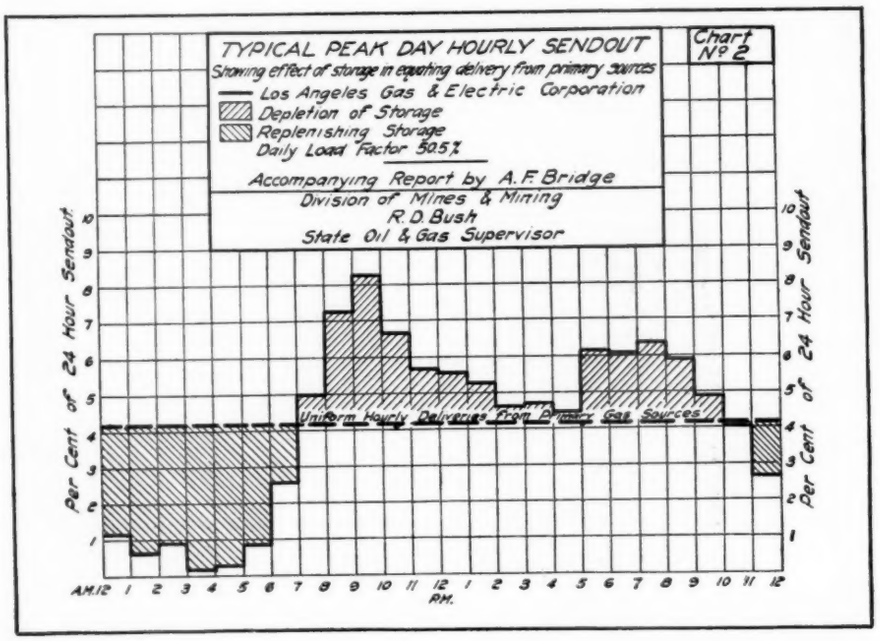
THE NATURAL GAS INDUSTRY


TYPICAL PEAK DAY HOURLY SENDOUT
Chart No 2
Showing effect of storage in equating delivery from primary sources
Los Angeles Gas & Electric Corporation
Depletion of Storage
Replenishing Storage
Daily Load Factor 50.5%
Accompanying Report by A.F. Bridge
Division of Mines & Mining
R.D. Bush
State Oil & Gas Supervisor
Uniform Hourly Delivery From Primary Gas Sources
Per Cent of 24 Hour Sendout
AM 12 1 2 3 4 5 6 7 8 9 10 11 12
PM.

jection, fall far short of the summer's surplus, and certainly even a combination of production curtailment and seasonal underground storage and withdrawal cannot be so regulated as to accommodate the wide and frequent daily changes in total demands for gas. While considerable waste is therefore unavoidable, it may be possible, by the methods which have been proposed, to match net gas production approximately with average seasonal gas demands and thereby conserve gas worth millions of dollars. The problem fully merits the study and costly experimentation which it is now receiving from the oil and gas industry.

Increasing Line

San Antonio, Texas.—As part of its expansion program, to take care of increasing consumption of natural gas, the Southern Gas Company, one of the Moody-Seagraves properties, is looping 12 miles of its 10-inch line between Three Rivers and San Antonio; and has just completed a compressor station at San Antonio for boosting its gas on to Seguin, New Braunfels and Austin; new lines to those towns having been completed this year.

The loop between Three Rivers and San Antonio will increase the capacity of the line by 7,000,000 cubic feet a day.

The new compressor station at San Antonio consists of four 160 horse power Hope engines. The station is already functioning. It was completed about a week ago. The gas which supplies Austin and points intermediate between there and San Antonio is from the Medina field.

Gas Men to Meet at Shreveport in January

Shreveport.—An interesting program is being prepared for the annual meeting here January 14-15 of the Southwestern division of the American Gas Association. A number of instructive technical papers will be read and interesting addresses will be delivered.

N. C. McGowan of the Palmer Corporation of Louisiana, past president of the natural gas department of the association, is aiding Harry C. Morris, of the Dallas Gas Company and vice-chairman of the natural gas department of the association, in arranging the program. Elmer Schmidt of the Lone Star Gas Company of Dallas, is also aiding in preparing the program.

Local arrangements are in charge of Mr. McGowan and a committee of Shreveport gas operators. Elaborate plans for the entertainment of the visitors are being made.

A trip to one or more of the nearby gas areas is planned for the opening day of the convention. Monday night, January 14, an entertainment program will be held.

The matter of attendance of the Southwestern division at the annual convention of the Natural Gas Department of the American Gas Association which meets next spring in Kansas City, will be one of the interesting topics to be discussed at the convention.

A woman speaker is scheduled to deliver one of the feature addresses at the meeting on "Domestic Advantages of Natural Gas," treating the subject from the household standpoint.

Distributing Systems Are Being Enlarged

Los Angeles.—A wide extension of the vast network of natural gas lines in the Los Angeles Basin is planned by the various distributing companies as the result of a future supply greatly in excess of requirements. With a large overproduction at Long Beach and a still greater surplus expected at Santa Fe Springs, the gas companies are encouraging the use of gas wherever it is possible. Despite the much larger supply of natural gas, prices to the consumer have been lowered but little.

Association Formed by Accountants

Tulsa.—Organization recently of Petroleum Accountants Society, incorporated under the laws of Oklahoma, inviting men more than 21 years of age who are genuinely interested in developing, improving, extending, and, as far as possible standardizing petroleum accounting as members offers standardization another place in the oil industry.

D. B. Catterlin, assistant secretary and auditor, Gypsy Oil Company, was appointed temporary secretary of the society at the organization meeting, and applications for membership are being received by him at 603 First National Bank Building, Tulsa.

The first regular meeting will be held December 13 at the Mayo Hotel, and a board of directors will be elected to serve the society.

At the organization meeting a membership committee was appointed consisting of all members of the Mid-Continent Regional Committee of the American Petroleum Institute's committee on uniform methods of oil accounting. Men residing in the Mid-Continent area may be elected as members, provided they are actively engaged as accounting officers and provided their duties conform in whole or in part of executive supervision over, or control of all or part of the accounting of an oil company. All members are entitled to have a vote and to hold office in the society.

Los Angeles—The Barnsdall Oil Company has re-completed O'Dea 13, in the Athens-Rosecrans field, with an initial production of 2100 barrels of 39 gravity oil and two million cubic feet of gas. The well was deepened to 5410 feet from the upper zone and apparently is producing from the Hoge zone.

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The new pipe mills of Bethlehem Steel Company are located at Maryland Plant, Sparrows Point, Md., near Baltimore.

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Intermediate Zone Major Factor At Santa Fe Springs

Wells completed in Buckbee sand continue to decline a rate regarded by field engineers as too fast; production from deeper wells 50,000 barrels

By BRAD MILLS
Staff Representative

LOS ANGELES.—The intermediate zone, virtually an unknown formation before a blowout revealed its possibilities, promises to become a major factor in Santa Fe Springs production, and may even rival the Buckbee zone in extent and uniformity, if the two wells completed in the sand prove representative of future producers. Regarded at first as a body of shale, with occasional streaks of oil sand, many of the operators did not see fit to core the formation. All were intent upon striking the Buckbee zone in the least possible time, and started coring about 100 feet above the point at which the objective was expected. Since the break between the intermediate and Buckbee zones is roughly 100 feet, only a small amount of the former was included at the best.

The Star Petroleum Company's Grohs 2, completed two weeks ago at 5535 feet, has increased its production from 2250 to more than 5000 barrels. More than 500 feet of the intermediate zone was included and the well has shown a steady gain since the initial test. The well was originally drilled to 5702 feet, and plugged back for a test of the intermediate sand. Gas production at first was unusually high, but the flow of oil did not attract unusual attention. Production gained more than 150 barrels daily for two weeks, giving the intermediate zone a distinct boost. The action of the well at first was disappointing because it included more than twice as much sand as wells completed in the Buckbee zone. The cleaning up process and the excessive gas production retarded the well, as shown by subsequent developments. While not as compact as the Buckbee zone, the intermediate sand more closely resembles the long-lived zones in other fields in the Los Angeles basin. It may not prove uniform, however.

George F. Getty's Nordstrum 17, the true discovery well of the intermediate zone, is still the star performer of the field, notwithstanding several reasons why it should have declined from the first known initial. When first gauged, the well made more than 5000 barrels. Production gradually increased to 6000 barrels and still remains at this figure. The well was not brought under control until it had run wild for more than two months and produced more than 400,000 barrels of oil .

FIRE OUT

LOS ANGELES.—The Bellview Oil Company's Grohs 2, which has been burning for more than three weeks, has been brought under control and placed on production.

The initial test showed a production of 2500 barrels of oil and 35 million cubic feet of gas. This was the second Santa Fe Springs well to blow out and burst into flames. Production had been estimated at 8000 barrels, but there was no reason why the yield should have been so high.

The most conservative estimates had placed the flow at 1000 barrels. An actual gauge showed the Buckbee zone producer to be slightly below the average in oil production but very high in the gas realm.

The well was brought under control from the surface, when workmen with asbestos suits succeeded in placing a control head on the casing. Tunneling was under way but was abandoned immediately after the effective work on the surface.

It will be observed that while the Buckbee zone wells are showing a steady decline, the intermediate zone producers are holding their own. There is little likelihood that the bottom of these wells tapped the Buckbee zone, since there is a distinct break between the two formations.

The Shell Company's G. H. N. 16, located near the edge of the field failed to make an impressive showing in the intermediate sand at 5335 feet, but the fact that the well is more than a mile from the center of the field may account for the heavy cut. Despite the isolation of the well, the intermediate zone was found in place.

Extends Buckbee

The Universal Consolidated Oil Company maintained its record-breaking pace with the completion of O'Connell 3, which came in with initial production of 6100 barrels. The well was completed in the Buckbee sand at 5784 feet and slightly extends the zone to the southeast. The oil was 35 gravity and showed a cut of only one-tenth of one per cent. This well gives the Buckbee zone a better appearance and indicates that the average initial production will be high, regardless of whether the decline will be rapid. The completion also discloses a slightly more satisfactory condition in the southeastern part of the field than along the western extension.

George F. Getty placed his No. 18 on production during the week, but the well sanded up and stopped flowing after producing 876 barrels in seven hours. The completion was effected in the Buckbee zone at 5772 feet and the action of the well may have been caused by a mechanical condition, rather than more serious causes. The oil was 32.9 gravity and cut 2.6 per cent, disclosing a slightly unsatisfactory condition and indicating that a leak in the shutoff may have caused the trouble.

Production from wells recently completed continues to decline at a rate regarded as too fast by field engineers. The Associated Oil Company's Jordan 2, completed 15 days ago, with an initial production of 6800 barrels, is now producing about 4500 barrels. The Texas Company's Matern 2-7 is showing a slower decline, having dropped from 4500 barrels to 3800 barrels in six weeks. The McKeon Drilling Company's Y. and L. 1, located less than 200 feet from the Belleview Oil Company's burning well, is producing only 900 barrels after three weeks. With a noticeable loss of pressure, this well has declined steadily since the Bellview producer burst into flames. A natural decline is to be expected, especially so since less than 150 feet of Buckbee zone has been included in the majority of completions.

A survey of the wells completed in the Buckbee sand shows that production will reach a high figure before the gas pressure can be released. The fact that the zone is comparatively thin means much in the long run, but with more than 100 wells due for completion during the next two months, production will rise very rapidly and fall just as quickly. This condition does not necessarily apply to the intermediate zone, making it possible for the field to produce at a high rate much longer than anticipated, solely for this reason.

50,000 Barrels from Buckbee

The 15 wells producing from the Buckbee and intermediate zones are now yielding about 50,000 barrels. With an average production of more than 3000 barrels, the completions to date are fairly satisfactory. The initial production of the largest well was 6800

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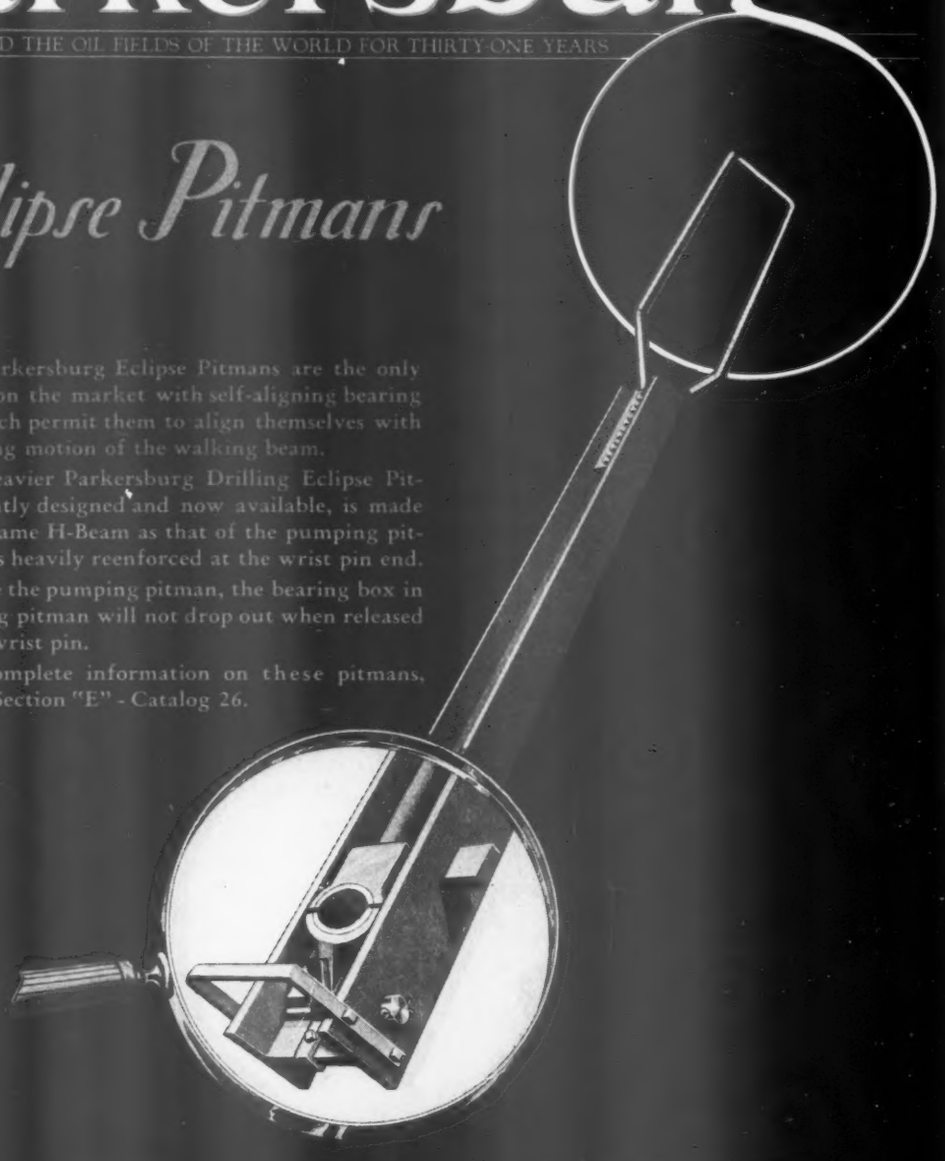
For complete information on these pitmans, write for Section "E" - Catalog 26.



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Say you saw it in The OIL WEEKLY

barrels, while the smallest slightly exceeded 2000 barrels.

Active drilling wells total 234, with 26 locations which probably will be reflected in drilling wells within a few weeks. New locations are being made at a reduced rate. Whether nearly all wells started will be completed depends largely upon the initial production of the second hundred wells. Ten wells are standing cemented over the Buckbee zone and two over the intermediate zone. All should be completed within two weeks.

The fear that water was entering the wells from the bottom of the Buckbee has been temporarily allayed with a nominal increase in the cuts of the wells in question. The Texas Company's Matern 2-7 is showing an average cut of less than eight per cent, with an occasional cut slightly higher. The Shell Company has been able to reduce the cut in Slusher 12 to seven per cent by plugging back to include only the top of the Buckbee zone. Production is now 2300 barrels. This well did not core the lower part of the formation and did not discover the water condition until a test of more than 100 feet of sand was made. Slusher 12 is located in the western part of the field but at a point which was thought to be satisfactory for a Buckbee zone test.

Workmen have succeeded in placing a huge funnel over the mouth of the Bellview Oil Company's Groh 2, which blew out and caught fire three weeks ago. The intensity of the fire has not been lessened, but the flames are fully 20 feet above the ground. The tunnel to the casing at a point 30 feet below the ground has been completed and compressors soon will be diverting the oil and gas to the tanks, making it possible to attack the fire from the surface. Experiments conducted while extinguishing the flames at another well will be avoided and the compressors will immediately start drawing the production through the tunnel.

Deep Test Delayed by Fishing Job

Ventura, Calif.—Richfield Oil Company has been unable to locate the water in Hobson 1, further postponing deep production in the Rincon field. In using the bailer to dump cement, the bailer was lost and another difficult fishing job encountered. The recent production test at 6530 feet revealed an unsatisfactory condition, but the fact that the gas pressure was sufficient to flow the well at a uniform rate was regarded as a favorable indication of oil production when the water is shut off. The initial production was about 700 barrels of fluid, of which fully 80 per cent was water. The company was attempting to shut off the water from the bottom when the bailer was lost.

The Standard Oil Company has acquired a 125-acre lease in the Muscle Shoals district, just outside the Rincon field. The recent discovery of an oil sand in the Elmer Oil Company's outpost well, near the lease, influenced the Standard Oil Company to make additional purchases. The company will start active operations soon.

Long Beach Production Takes Down Turn

Los Angeles.—Production at Long Beach, after gaining more than 5000 barrels during the previous week, reversed its form during the past week and headed downward for a loss of 6000 barrels. New production totaled only 2500 barrels, as compared with a natural decline of about 8000 barrels. The Shell Company got three of the four completions during the week, including Hutton-Community 8, Hutton-Community 9 and Martin 6. Hutton-Community 9 was the best well in the list, producing 1600 barrels during the initial test. Hutton-Community 8 was an 800-barrel well, while Martin 6 produced 800 barrels. The other completion was General Petroleum Corporation's Kelly 6, a workover, which pumped about 50 barrels. The Dabney-Johnston Oil Corporation's No. 20, located near Thirty-third and Pine Streets, was tested at 6082 feet and found wet. If successful, this well would slightly extend the producing limits of the deep zone. Several locations have been made on the strentgh of the cores taken from this well.

Seal Beach Wells Make Unfavorable Showing

Los Angeles. — Marland Oil Company has succeeded in placing Bixby 24 on production, but this latest Seal Beach producer is not giving a very satisfactory account of itself. The well started producing only a very small amount of oil and water from 4825 feet, but gradually increased its yield to 700 barrels of oil and 300 barrels of water. This well is located in the conservatively developed part of the field.

George F. Getty's Fee 2, deepened to 6900 feet, is flowing only 135 barrels, of which about 30 per cent is water. The well did not flow at all until placed on the compressor.

Test Fails

Los Angeles.—The Shell Company has tested Stern 1-1, a semi-wildcat test near Fullerton, but the well failed to flow from 6300 feet. The company ran a string of 4¾-inch casing to bottom, including about 600 feet of perforated pipe. Stern 1-1 was tested two months ago at 5900 feet and pumped at a commercial rate. Shallow production was developed in the district several years ago.

Fruitvale

Bakersfield, Calif.—The Pacific Eastern Production Company has made an unsuccessful production test of Lahore 1, in the Fruitvale field, the first time in six attempts that a successful water shutoff has not been effected. The well has been re-cemented. Lahore 1 was drilled to 3935 feet, with a string of 10-inch casing cemented at 3675 feet. The company's No. 1, Section 21-29-27, has been completed and shut in. The well was the first producer in the field, and was later chosen as a deep test. After drilling past 6000 feet, the well was plugged back to 4100 feet and produced at a commercial rate on the final test.

Belridge

Taft, Calif.—The shallow Belridge field is showing more activity than at any time during the year, an occasional completion being closely followed by one or more new locations. Production in this area is obtained at depths ranging from 600 to 1000 feet. The Ohio Oil Company, one of the latest entries into the field, has completed two wells on Section 30-28-21 and is drilling a third test on the same section.

Kern Front

Bakersfield, Calif.—As long as the line wells in the Kern Front field are produced, drilling of new wells will continue at a reduced rate. The resumption of operations necessitated a limited amount of drilling. The landowners contend that offsets are necessary and the major companiesa are drilling additional wells only because they feel it is necessary. General Petroleum Corporation has completed Wetmore 13, Section 14-28-27, with an initial production of 100 barrels.

Simi District

Ventura, Calif.—The Shell Company will drill another well in the Simi district, following the abandonment of Berylwood 1 at 7200 feet. The second well has been located on Section 31-3-17. This district has been extensively drilled, but only a small amount of production developed.

Hawthorne

Los Angeles.—Another test of the Smith Petroleum Company's Berry 1, in the Hawthorne field, will be made at 5830 feet. The well was tested at 5400 feet but flowed water and a small amount of oil. The discovery well was completed at 5850 feet and in the same formation Berry 1, is being tested.

Elwood

Santa Barbara, Calif.—The Barnsdall Oil Company and Rio Grande Oil Company have made little headway in their effort to complete Elwood Acres 1, an outpost well in the Elwood field. Additional hole has been made below the 4¾-inch lines at 4405 feet, but the idea of removing the liner has not been abandoned. The deepening of the hole with the liner intact is a very difficult process. The companies are drilling three additional wells in the field and expect to keep at least two strings of tools busy in future.

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Say you saw it in The OIL WEEKLY

Bill Would Place a Dollar a Barrel Tariff on Imported Crude

WASHINGTON, D. C.—A tariff of one dollar a barrel on all crude imported into the United States will be sought during the present session of congress by Representative E. B. Howard, of Oklahoma, who has introduced a bill to that effect. Congressman Howard points out that large quantities of South American oil are now coming into the United States, which makes it more than ever necessary to curb this flood of oil by placing a tariff on all crude imports.

"Hundreds of oil wells in the Mid-Continent field, which are the basis of the American oil supply," said Congressman Howard, "are operated at a loss. A year's delay in obtaining action on the suggested tariff would mean a large loss to American oil producers."

The following import and export figures for the first 10 months of 1927 and 1928, give some idea of the possible effect of the proposed tariff:

Imports of Crude Oils

(10 Months Ending October 31)

From—	1927	1928
Mexico	22,828,000	14,026,000
Venezuela	15,301,000	38,931,000
Colombia	6,160,000	10,287,000
Other Countries	2,545,000	2,624,000
Total	46,834,000	65,868,000

Exports of Refined Products and Crude

(10 Months Ending October 31)

	1927	1928
Refined Products	105,300,000	115,715,000
Crude Oil	12,846,000	15,744,000
Total Exports	118,146,000	131,459,000

The above figures show that the difference in imports and exports for the two periods represents an excess of crude imports aggregating 5,721,000 barrels. In other words, the gain in crude imports over last year is now considerably in excess of the gain shown in exports of both crude and refined oil. However, exports of crude and refined oils still are more than twice the volume of crude imports.

While it is not likely that tariff bills will be acted upon during the present session of congress, the house ways and means committee is expected to begin hearings next month. The bill will be ready for presentation either at the extra session which is expected to be called by the president shortly after his inauguration, or at the next regular session of congress.

President Wants Special Prosecutor Law Changed

Washington, D. C.—Enactment of an amendment to the law creating the office of special government counsel for prosecution of the oil cases, exempting them from the general rule against taking other cases involving the government, was urged upon congress by President Coolidge in his annual message, delivered at the beginning of the session.

"In order to prosecute the oil cases," the president pointed out, "I suggested and the congress enacted a law providing for the appointment of two special counsel. They have pursued their work with signal ability, recovering all the leased lands besides nearly $30,000,000 in money and nearly $17,000,000 in other property. They find themselves hampered by a statute, which the attorney general construes as applying to them, prohibiting their appearing for private clients before any department. For this reason, one has been compelled to resign. No good result is secured by the application of this rule to these counsel, and as Mr. Roberts has consented to take reappointment if the rule is abrogated I recommend the passage of an amendment to the law creating their office exempting them from the general rule against taking other cases involving the government."

Los Angeles.—Failure of the Petroleum Securities Company to drill Cone 16, originally intended as a deep test of the Inglewood field, is accounted for by the fact that the company has been purchased by New York and Los Angeles capital. The attitude of the new company toward deep sand development in the Inglewood field has not been learned.

The Interior Department Gives Report of Activity

Washington, D. C.—Sixty-five developed oil and gas fields with an annual production of 33,000,000 barrels of oil, and 4,000,000 acres of oil shale from which possibly 60,000,000,000 barrels can be extracted when high prices arrive to warrant the higher cost comprised part of the great mineral estate of the United States government, known as the public land, it is declared in the annual report of the Secretary of the Interior, just made public.

In the management of this vast estate, the report points out, the supervision of 543 oil and gas leases, together with the 22,000 prospecting permits is the largest item and the one requiring the highest degree of technical and legal attention.

The production of petroleum on public land during the fiscal year ended June 30, last, was 23,370,549 barrels, on which the oil gas, and gasoline royalty value was $3,735,451, the report shows. Petroleum produced on the naval oil reserves amounted to 9,839,859 barrels, on which the oil, gas and gasoline royalty value was $2,232,375.

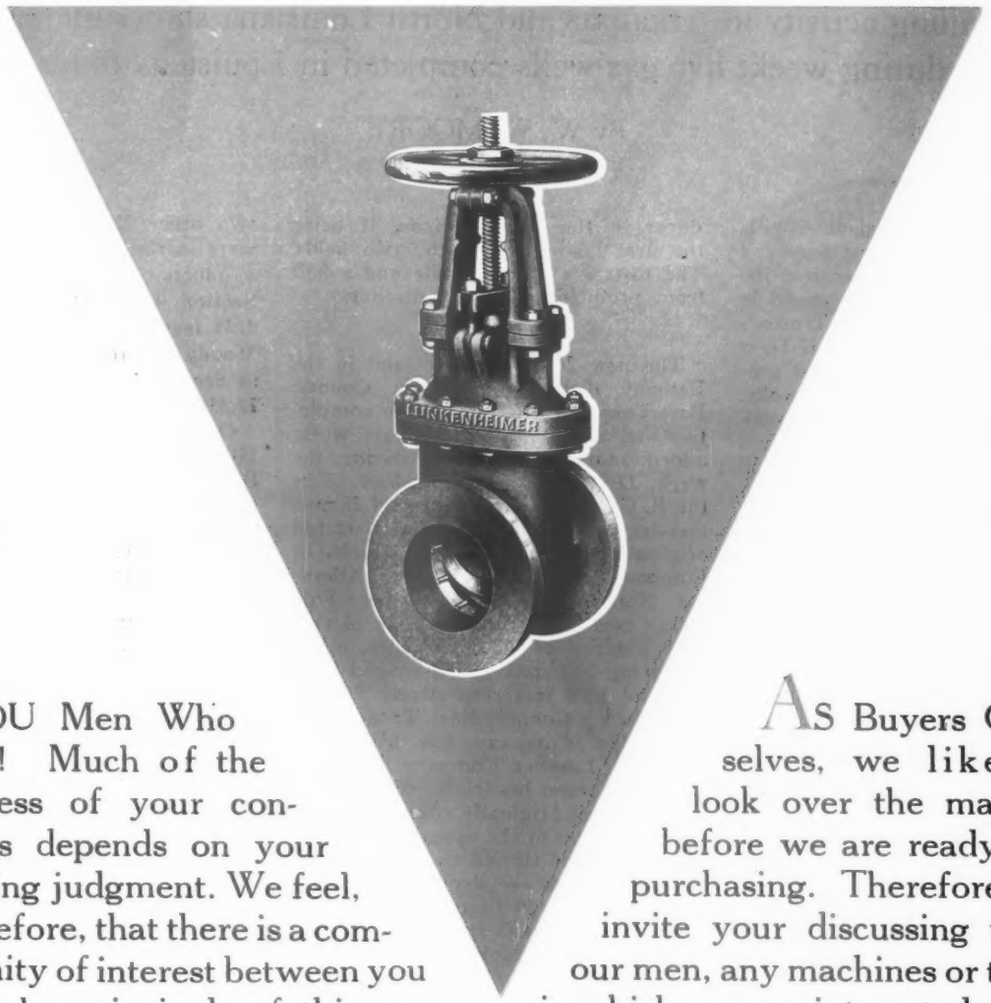
The report does not show that the Federal Oil Conservation Board has been particularly active during the past six months, its last action being the submission to the governors of the oil producing states of the report made by the so-called "committee of nine" which recomends federal and state legislation to legalize agreements for cooperative development and operation of single oil pools and to permit curtailment of production in times of surplus supply. However, it is declared, the cooperation urged upon the industry has become an active working force and practical conservation of petroleum is being attained through cooperation of federal and state officials with the executives of oil companies. "Conservation in its broadest sense, however," it is declared, "is not yet an accomplished fact. Much remains to be done, both by the federal and state governments, if our natural petroleum resources are to be conserved."

Bidders for Government Royalty Oil

Casper, Wyoming.—The names of the White Eagle Oil & Refining Company, the Midwest Refining Company, The Texas Company, the Producers & Refiners Corporation, the Continental Oil Company, and the Ohio Oil Company are being mentioned as among those major oil companies who are bidding for the Salt Creek royalty oil belonging to the federal government. Outside of the Midwest Refining Company which has adequate gathering lines of its own, any company receiving the contract will have to spend about $250,000 to prepare to handle the oil. At Teapot Dome there is more than a million barrels of crude stored; this formerly belonged to the Mammoth Oil Company.

The Midwest Refining Company has a line from the field to Casper. The Producers & Refiners Corporation has one from the field to Parco, with station delivery at Casper. Ohio Oil Company has a line from the field to Illco. Sinclair Pipe Line Company has the famous line from the field to Freeman, Missouri. And the Central Pipe Line Company has a line from the field to Casper. The Empire State Oil Company has gathering lines in the field, and the Empire and the Central together have almost a complete system. The Central Company's stock is controlled by the New York Oil Company.

Buyers Speak to Buyers



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BEAUMONT HOUSTON SHREVEPORT FORT WORTH

Sabine Parish Wildcat Makes 41 Gravity Oil

Drilling activity in Arkansas and North Louisiana shows increase during week; five gas wells completed in Louisiana fields

By W. W. MOORE
Special Representative

SHREVEPORT, La.—Sabine Parish, scene of scores of wildcat tests and many shows of oil ranging from 700 to 4600 feet is again in the limelight in North Louisiana. R. L. Gay, Trustee's Bowman-Hicks 2 in Section 14-17-14, a rank wildcat, 20 miles from nearest production and nine miles west of Zwolle, flowed 41 gravity oil by heads last week from Nacatosh sand at 2130 feet. Scouts estimate production good for 30 to 50 barrels as the well stands. Liner was set Saturday afternoon.

The test for the first three days made oil by heads at intervals of 45 minutes to an hour. The oil was entirely free of salt water. Whatever the outcome of the well may be it is due to cause an increase in wildcatting in Sabine Parish, which has been replete in exploration activity for several years.

Champagnolle, Union County, Arkansas, the most active field in this territory, has approximately three dozen rigs running. Activity continues to center in the northeast part of the field, in Sections 6 and 7-17-13. Following a 1,400 barrel well completed there 10 days ago by Ohio Oil Company in C. B. Nash 2, Account 1, which is maintaining a daily flow of 1052 barrels, the Lion Oil & Refining Company last week added Nash 3 in the northeast of the southwest of Section 6-17-13 as a 670 barrel flowing well from 3062 feet.

Two salt water wells were added in the northeast part of the field, including Ohio Oil Company's Carroll 1 in Section 6-17-13, deepened to 3005 feet, testing briny fluid and being abandoned. The same company's Carroll 1 in Section 1-17-14, was abandoned as a salt water well at 3174 feet.

On the southern border of the older district, Lion Oil & Refining Company added two small producers in Rowland Nos. 2 and 5, both in Section 15-17-14. The former is pumping 13 barrels from 2980 feet while the latter is yielding 70 barrels of oil along with 2000 barrels of salt water on air from 3207 feet.

Another link between the southwest edge of Champagnolle and the northeast part of the old El Dorado East Field (Calion) was forged during the week when Root Refineries put Mullins 1 in Section 21-17-14 on the beam at 2828 feet. The well is pumping 10 barrels of oil and 250 barrels of salt water. The same company last summer completed Jerry 1 in this section as a producer in the same horizon, it being the first linking up of the two fields. The tests are about a mile and a half from production in both districts.

East Texas

The new 2600-2700 foot sand in the Bethany district of Panola County, East Texas, which entered the completion list for the first time last week, added another dry gasser during the week. D. Thomason's Crenshaw 11 in the B. C. Jordan survey, gauged 25 million feet of gas. This well was started originally by the Arkansas Fuel Oil Company, a subsidiary of the Arkansas Natural Gas Corporation. This makes two commercial gassers in this third horizon of Panola County, other producing horizons being around 1000 feet and 1900 feet respectively.

In Shelby County, East Texas, Gulf Production Company has killed its Pickering Lumber Company 1 in the G. H. Patterson headright, with baroid after the well originally completed in a lime formation of the upper Cretaceous at 3382 feet had flowed two weeks. The daily yield, however, declined from 154 barrels daily to 30 barrels. The test is now coring at 3400 feet still in lime. The well was a rank widcat and the first oil producer of that volume ever added in Shelby County.

Besides the wells already mentioned East Texas accounted for two failures during the last week. Bert Longenheim's Atkinson 1, in the Lonson-Moore survey of Red River County, was abandoned as dry at 1065 feet, and a similar fate meeting McRitchie and Associates' Mrs. A. C. Baldwin 1, in the Fuller survey of Harrison County.

North Louisiana Gas Wells

North Louisiana did not add an oil producer during the week but got five gassers. On the southeastern edge of the Shongaloo gas field of Webster Parish two small gassers were added in Virgil Helm's Maxwell 1 in Section 7-22-9, completed as a 9,500,000 foot well at 2680 feet, and Magnolia Petroleum Company's W. P. Bond 1 in Section 5-22-9 being added at 2619 feet as a 6,730,000 foot well.

On the Caddo Parish side of the Elm Grove gas field in Bossier Parish, Woodley Petroleum Company added Whitehurst 2, in Section 7-16-12 as a 6,500,000 foot gasser at 2475 feet. The two other North Louisiana gas wells were in the Monroe field, Natural Gas Products Company completing Fee 1 in Section 9-20-4e Moorehouse Parish at 2135 feet as a 10,000,000 foot well and Moody & Seagraves adding Dawkins 1 in Section 17-20-4e, Union Parish, as a 12,232,000 foot gasser from 2140 feet.

On the southern edge of the Spring Hill gas field where it reaches into Bossier Parish, Arkansas Natural Gas Corporation abandoned as a salt water well its Wilkinson 1 at 3068 feet. The test is in Section 5-22-11. Morgan Oil Company tested dry and abandoned Smith 2 in Section 26-19-11 on the southeast corner of the Bellevue shallow field in Bossier Parish.

In LaSalle Parish, Randall and associates junked and abandoned Urania 1 in Section 12-10-1e, a test which blew in at 690 feet as a 10,000,000 foot gasser, later bridging over and defying efforts to revive it. The same operators have secured a permit to drill another test offsetting the junked hole.

H. C. McDonald's Union Sawmill 1 in Section 18-23-1e, Norma district, Union Parish, where a number of tests are under way, and a few small producers have been added and where one recently tested salt water and was abandoned at 2305 feet.

An effort to extend the Shongaloo gas field of Webster Parish eastward toward production in the Haynesville oil field, ended in failure, the Ohio Oil Company testing salt water and abandoning Haynes 1, in Section 30-23-9. C. T. Lue has abandoned his location for Taylor 1 in Section 29-22-6, Claiborne Parish. The Woodley Petroleum Company has abandoned location for Duke 2, in Section 22-21-10 in the Cotton Valley field.

Arkansas Wildcats

Besides the activity in Champagnolle, Arkansas added two wildcat failures during the week. McKenzie Oil Company, after fishing for some time for drill stem in Eakins 1, in Section 9-11-19w, Clark County, junked the hole at 1700 feet. Pine Prairie Oil and Gas Company, which has been shut down for some time in Carter 1 in Section 33-10-6, Lincoln County, abandoned the hole as a dry test at 2126 feet.

The total completions for the week in this area comprised four producers, all

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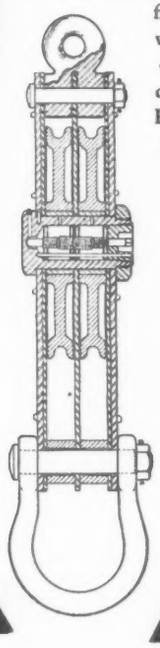

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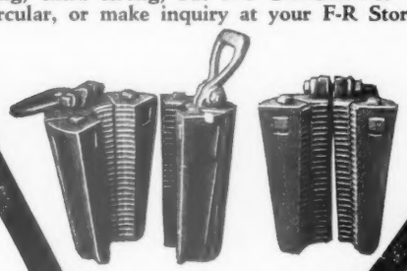

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in Champagnolle, with a combined yield of 763 barrels, six gassers, and 11 failures.

Major interest in wildcats in North Louisiana at present is centered, aside from the Gay test in Sabine Parish, in Dixie Oil Company's Gilbert 1 in Section 27-21-5w, Claiborne Parish, a deep test, where 6⅝-inch casing has been set at 4201 feet on bottom. Another deep test in the Haynesville district of the same parish is Smitherman & McDonald's Miller 1, in Section 17-23-8, which is drilling at 3901 feet.

In Ashey County, Arkansas, Atlantic Oil Producing Company is reaming to bottom in Moffat 1, in Section 28-16-8 at 3864 feet. Bradley County, another wildcat area, will get another test with Ohio Oil Company having made location for Southern Lumber Company 2, in Section 19-16-9. Rig is being built. In Union County, Calgo Oil Company's Primm 1, a wildcat in Section 9-18-17 is coring at 3475 feet after testing dry through drill stem from 3365 to 3395 feet. Stark and Associates' Powell 1, another Union County wildcat, in Section 35-18-15, tested 24 fourbles of salt water in a drill stem test from 2665 to 2673 feet.

Drilling activity during the week showed an upward turn with 15 new locations announced in this area. Only seven new wells were located the week before. Champagnolle led the list of new locations for the past week with seven. Bradley County added one, making eight for Arkansas. Six were announced in North Louisiana and one in East Texas.

In Champagnolle, Ohio Oil Company announced location for five tests, four in the northeast section of the field. The four are: J. S. Alphin 2, in Northwest of northwest of Section 7-17-13; Frazier 2, in southwest southwest of Section 6-17-13; Nash 4, Account 1, SE SW of 6-17-13; and Nash 1, Account 3 NW SE Section 6-17-13. The Ohio Oil announced location for L. L. Ward 1, NE SE Section 15-17-14. Lion Oil Refining Company also announced a location for the northeast part of the field in its Nash 2, NE SW of Section 6-17-13. The other location for Champagnolle was A. F. Hatcher's McCain 1, SW SE Section 4-17-14. Ohio Oil Company's new location for Bardley County, Southern Lumber Company 2 in 330 N and east of the center of Section 19-16-9, was the eighth location for Arkansas.

Louisiana's six new locations are: Bayou State Oil Company's Hoss 34 in NW SW of Section 24-22-15, Caddo Parish; H. C. McDonald's Union Sawmill 2, Section 18-23-1e, Union Parish; Southern Carbon Company's Miles 2, and Tensas Delta 8, the former in Section 1-20-4e, and the latter in Section 2-20-4e; Ouachita Natural Gas Company's Pardue 4, Section 5-15-6e, Richland Parish; Randall and Associates' Urania 2, Section 1-10-1e. Announcement of the location of Shad Harper's Garland 1 in the Wagley survey of Red River County, already down 1590 feet, was made during the week.

Mountain Association to Meet Next in Canada

Great Falls, Mont.—The Montana chapter of the Rocky Mountain Oil & Gas Association will meet next year at Calgary, in Alberta, Canada, it was decided at the final sessions of the annual convention at Great Falls last week. At that time a Canadian chapter of the association will be formed, many Canadian representatives of the industry having been present at the convention to petition for such action.

Donald Campbell, secretary of the Mid-Northern Oil Company, was elected the new president of the Montana chapter; the vice-presidents are LaRue Smith of the Texas Pacific Coal & Oil Company, G. C. Stevenson of the Sunburst Oil & Refining Company, C. W. Landsrud of the Continental Oil Company, O. I. DeSchon of the Montana Oil Journal, J. C. Jordan of the Montana Cities Gas Company, and L. F Sonntag, drilling contractor; R. P. Jackson was elected treasurer and W. F. Brittain was re-elected secretary.

Among resolutions passed was one stating the association's absolute opposition to the projected raise in the gasoline tax in Montana.

Pondera

Great Falls, Mont.—Further proof that the Pondera field will extend eventually to the northwest of the established production, and that the wells in that direction will be larger producers is apparently established by the completion of the Fulton Petroleum Company's Jones 1, Section 9-27n-4w, which produced 500 barrels from 2020 feet. This is one of the largest wells in the field.

A survey of the field activities showed eight new wells completed, one of which was a gas well. All will be average producers.

New Michigan Area Gets Drilling Test

Buchanan, Michigan.—Following the recent rich strikes in the Muskegon district, activity has been stimulated in various parts of the state, including southeastern Berrien County, in which area oil was found 25 years ago but not in commercial quantity. Drilling is expected to be started within a few weeks in the Buchanan and Niles vicinities, following blocking of two large leases by a syndicate of 50 Chicago, Benton Harbor and St. Joseph men, headed by J. Theison, Benton Harbor oil distributor. This organization leased 3000 acres of land north of Niles and 1000 acres in the bend of the river district northeast of Buchanan. The members of the syndicate have made up a pool of $100,000 for drilling expenses, and will make further expenditures if they are warranted by the preliminary work.

The above mentioned leases were taken on the basis of a one-eighth royalty, plus a flat income of $200 a year for each well located.

The Buchanan district has been designated as favorable oil territory by the Michigan geological department, but the present activity is based principally on the fact that in 1903 oil was discovered at 625 feet on the Charles Umholtz farm, about five miles northeast of Buchanan. It flowed 20 barrels per day for a few days, but then dropped off to a non-profitable amount of production.

Gebo Dome

Casper, Wyo.—All of the holdings on Gebo Dome, north of Thermopolis in Hot Springs County, belonging to the Ohio Oil Company, the Mountain States Petroleum Company, the Gebo Oil Company, and the Arkansas Natural Gas Company, have been turned over to the newly-organized Gebo Consolidated Oil Company, and the last named will immediately drill a well on that structure. The control of the new company is held by Westland Oil, Inc.

The Utah Oil Refining Company and the Mountain States Petroleum Company drilled a deep test on Gebo Dome several years ago. The location was in Section 23-44-95; a recent geological investigation would indicate that this test was probably more than one-half mile from the axis of the structure and that it is approximately 400 feet lower than the "high" of the dome.

Phillips Dividend

Bartlesville, Okla.—The directors of the Phillips Petroleum Company declared the regular quarterly dividend of 37½ cents per share and an extra dividend of 50 cents per share both payable January 2, 1929, to stockholders of record December 14, 1928.

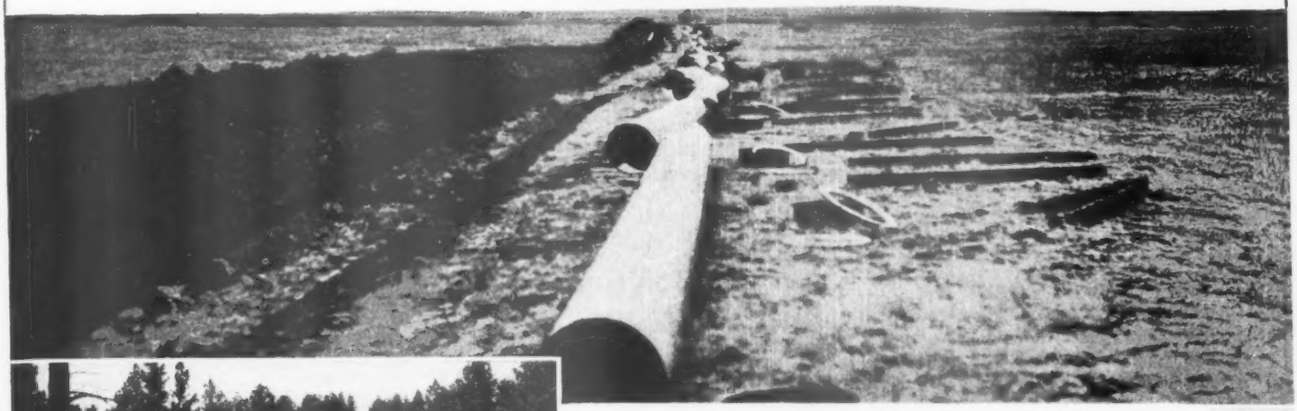
President Frank Phillips stated that while this has not been a good year in the oil industry, the company will more than earn its present regular and the extra dividend after all charges including depletion and depreciation.

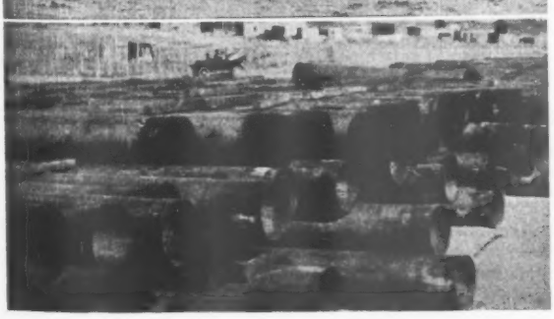
The company has at present approximately $30,000,000 of cash and other current assets which is more than seven times current liabilities. Four and one-half million dollars of Phillips bonds have been repurchased for investment, which are not carried as current assets and the company will retire one million dollars of the bonds through its sinking fund December 1 this year.

Frannie Structure

Frannie, Wyo.—An offset to the discovery well on Frannie structure, Big Horn County, northern Wyoming, will be drilled by the original promoters of the Frannie test, Julius Peters and V. M. Kirk, both of Great Falls. The well was completed by the E. H. Rosenburg interests, and the leases recently turned over to the Midwest Refining Company, which will drill six wells at once, it is reported.

Amarillo-Denver Gas Line





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CRUDE OIL PRICE QUOTATIONS

CURRENT POSTINGS

EASTERN STATES

	Dec. 4 1928
Penna Grade Oil in New York Transit Lines (New York)	$3.60
Bradford District Oil in National Transit Lines (Pennsylvania)	3.60
Penna Grade Oil in National Transit Lines (Pennsylvania)	3.50
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	3.50
Penna Grade Oil in Eureko Pipe Line Lines (Pennsylvania)	3.40
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	3.25
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia) (July 13)	1.45
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s lines (August 8)	1.70
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s lines (Aug. 8)	1.80
Somerset Oil in Cumberland Pipe Line lines (Kentucky) (Sept. 14, 1928)	1.75
Ragland Grade Oil in Cumberland Pipe Line lines (Kentucky) (August 1)	.95
Keister (Pennsylvania)	1.20

CENTRAL STATES

Illinois	1.55
Indiana	1.37
Lima	1.60
Plymouth	1.28
Princeton	1.55
Waterloo	1.35
Wooster	1.77

WESTERN KENTUCKY

Posted by Stoll Refining Company for crude from Allen, Warren, Franklin, Davies, Barren.

All grades	1.75

MID-CONTINENT

Carter Oil Company, Gulf Pipe Line Company, Sinclair Pipe Line Company, Prairie Oil and Gas Company and The Texas Company.*

	Dec. 4 1928
25. to 25.9 gravity	.67
26 to 26.9 gravity	.74
27 to 27.9 gravity	.81
28 to 28.9 gravity	.88
29 to 29.9 gravity	.95
10 to 30.9 gravity	1.02
31 to 31.9 gravity	1.09
32 to 32.9 gravity	1.16
33 to 33.9 gravity	1.21
34 to 34.9 gravity	1.26
35 to 35.9 gravity	1.31
36 to 36.9 gravity	1.36
37 to 37.9 gravity	1.41
38 to 38.9 gravity	1.46
39 to 39.9 gravity	1.51
40 to 40.9 gravity	1.56
41 to 41.9 gravity	1.61
42 to 42.9 gravity	1.66
43 to 43.9 gravity	1.71
44 and above	1.76

*The Texas Company posts a price of 60 cents on 24 to 24.9 gravity, and Gulf's posting begins at 28 to 28.9.

MID-CONTINENT

Magnolia Petroleum Company

Below 25 gravity	.60
25 to 25.9 gravity	.67
26 to 26.9 gravity	.74
27 to 29.9 gravity	.75
30 to 30.9 gravity	.90
31 to 31.9 gravity	1.05
32 to 32.9 gravity	1.16

From 33 to 44 gravity and above, Magnolia Petroleum Company prices are the same as those of Carter Oil Company.

NORTH AND CENTRAL TEXAS

Ranger, North Texas, Mexia, Powell, Richland, Wortham, Currie, Moran, Nocona and Lytton Springs Crude (Humble Oil and Refining Company)*

25 to 25.9 gravity	.67
26 to 26.9 gravity	.74
27 to 27.9 gravity	.81
28 to 28.9 gravity	.88
29 to 29.9 gravity	.95
30 to 30.9 gravity	1.02
31 to 31.9 gravity	1.09
32 to 32.9 gravity	1.16
33 to 33.9 gravity	1.21
34 to 34.9 gravity	1.26
35 to 35.9 gravity	1.31
36 to 36.9 gravity	1.36
37 to 37.9 gravity	1.41
38 to 38.9 gravity	1.46
39 to 39.9 gravity	1.51
40 to 40.9 gravity	1.56
41 to 41.9 gravity	1.61
42 to 42.9 gravity	1.66
43 to 43.9 gravity	1.71
44 and above	1.76

SOUTH TEXAS

Mirando	1.00

SOMERSET

Grayburg

	Dec. 4 1928
Below 33 gravity	1.05
33 to 33.9 gravity	1.07
34 to 34.9 gravity	1.09
35 to 35.9 gravity	1.11
36 to 36.9 gravity	1.13
37 to 37.9 gravity	1.15
38 and above	1.17

GULF COAST

Grade "A" all companies	1.20
Gulf Coast Light Oil, below 25	1.15
25 to 25.9 gravity	1.17
26 to 26.9 gravity	1.19
27 to 27.9 gravity	1.21
28 to 28.9 gravity	1.23
29 to 29.9 gravity	1.25
30 to 30.9 gravity	1.27
31 to 31.9 gravity	1.29
32 to 32.9 gravity	1.31
33 to 33.9 gravity	1.33
34 to 34.9 gravity	1.35
35 to 35.9 gravity	1.37
36 to 36.9 gravity	1.39
37 to 37.9 gravity	1.41
38 to 38.9 gravity	1.43
39 to 39.9 gravity	1.45
40 and above	1.47

*Humble Oil & Refining Company's postings on Gulf Coast Light stop at 35 to 35.9. Its price on all crudes above 35 to $1.37 per barrel.

Magnolia Petroleum Company's postings stop at 31 to 31.9.

MARKHAM

The Texas Company

All grades	1.00

LULING

All grades	1.00

PANHANDLE GRAY COUNTY

(Humble Oil and Refining Company, Magnolia Petroleum Company, Gulf Pipe Line Company and Sinclair Pipe Line Company).

Below 29 gravity	.68
29 to 29.9 gravity	.75
30 to 30.9 gravity	.82
31 to 31.9 gravity	.89
32 to 32.9 gravity	.96
33 to 33.9 gravity	1.01
34 to 34.9 gravity	1.06
35 to 35.9 gravity	1.11
36 to 36.9 gravity	1.16
37 to 37.9 gravity	1.21
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.31
40 to 40.9 gravity	1.36

CALIFORNIA CRUDE OIL PRICES AT THE WELL

Following are the current prices offered by Standard Oil Company for crude oil at the well: (Price per barrel of 42 gallons in fields indicated.

Gravity	Signal Hill	Alamitos Hts Seal Beach	Huntington Beach	Inglewood	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Torrance	Richfield	Whittier La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway Sunset Elk Hills	Buena Vista Hills	Lost Hills	Coalinga	Wheeler
14-14.9	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ .85	$ ...	$ .50	$ .75	$ .75	$ .75	$ .75	$ .75
15-15.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
16-16.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
17-17.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
18-18.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
19-19.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.85	.85	...	.50	.75	.75	.75	.75	.75
20-20.9	.85	.85	.85	.85	.85	..	.85	.85	.85	.86	.85	..	..	.77	.77	.77	.77	.77
21-21.9	.89	.89	.89	.89	.89	..	.89	.89	.88	.89	.88	.89	..	.79	.79	.79	.79	.79
22-22.9	.93	.93	.93	.93	.93	..	.93	.93	.91	.92	.91	.92	..	.82	.82	.82	.82	.82
23-23.9	.97	.97	.97	.97	.97	..	.97	.97	..	.95	.94	.95	..	.86	.86	.86	.85	.85
24-24.9	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	..	.98	.97	.98	..	.90	.90	.90	.88	.88
25-25.9	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	..	1.01	1.00	1.01	..	.95	.95	.95	.91	.91
26-26.9	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	..	1.04	1.04	1.04	..	1.00	1.00	1.00	.94	.94
27-27.9	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	..	1.07	1.08	1.07	..	1.05	1.05	1.05	.98	.97
28-28.9	1.17	1.17	1.17	1.17	1.17	1.17	1.17	1.17	..	1.10	1.12	1.10	..	1.10	1.10	1.10	1.02	..
29-29.9	1.21	1.21	1.21	..	1.21	1.21	..	1.21	..	1.13	1.16	1.15	..	1.16	1.16	1.16	1.06	..
30-30.9	1.25	1.25	1.25	..	1.25	1.25	..	1.25	..	1.16	1.20	1.20	..	1.22	1.22	1.22	1.10	..
31-31.9	1.30	1.30	1.30	..	..	1.30	..	..	..	..	..	1.25	..	1.28	1.28	1.28	1.14	..
32-32.9	1.35	1.35	1.35	..	..	1.35	..	..	..	..	..	1.30	..	1.34	1.34	1.34	1.18	..
33-33.9	..	..	..	..	..	1.41	..	..	..	..	..	1.35	..	1.40	1.40	1.40	1.22	..
34-34.9	..	..	..	..	..	1.47	..	..	..	..	..	1.40	..	..	..	1.46	1.26	..
35-35.9	..	..	..	..	..	1.53	..	..	..	..	..	1.45	..	..	..	..	1.30	..
36-36.9	..	..	..	..	..	1.59	..	..	..	..	..	1.50	..	..	..	..	..	..
37-37.9	..	..	..	..	..	1.65	..	..	..	..	..	1.55	..	..	..	..	..	..
38-38.9	..	..	..	..	..	1.71	..	..	..	..	..	1.60	..	..	..	..	..	..
39-39.9	..	..	..	..	..	1.77	..	..	..	..	..	1.65	..	..	..	..	..	..
40-40.9	..	..	..	..	..	1.83	..	..	..	..	..	..	..	..	..	..	..	..
41-41.9	..	..	..	..	..	1.89	..	..	..	..	..	..	..	..	..	..	..	..
42-42.9	..	..	..	..	..	1.95	..	..	..	..	..	..	..	..	..	..	..	..

extra!

Your customers get **extra** satisfaction with **OPALINE**
REG U S PAT OFF
..the **extra** service Motor Oil

AUTHORIZED Opaline Dealers ask the motorist who drives up for motor oil this simple question—*"What's Your Mileage?"* The answer indicates on the Sinclair Recommendation Index which grade of Opaline Motor Oil he needs to fit the degree of wear in his engine to prevent the power from blowing by his pistons. This is the *extra* service he gets from the right grade of Opaline. The right *grade* of motor oil is just as important as the right *quality.* Authorized Opaline Dealers give *both*—they give *extra* service—and they get *extra* business! May we tell you about the sound, simple Opaline method of selling *precision* in lubrication? It pays.

SINCLAIR REFINING COMPANY, INC.

Also Makers of Sinclair Gasoline and H-C Gasoline

45 NASSAU STREET, NEW YORK

Atlanta Boston Chicago Houston Kansas City

© 1928 S. R. C.

	Dec. 4 1928
41 to 41.9 gravity	1.41
42 to 42.9 gravity	1.46
43 to 43.9 gravity	1.51
44 and above	1.56

WHEELER COUNTY
(Humble Oil and Refining Company and Magnolia Petroleum Company)

Below 30 gravity	.65
30 to 30.9 gravity	.72
31 to 31.9 gravity	.79
32 to 32.9 gravity	.86
33 to 33.9 gravity	.91
34 to 34.9 gravity	.96
35 to 35.9 gravity	1.01
36 to 36.9 gravity	1.06
37 to 37.9 gravity	1.11
38 to 38.9 gravity	1.16
39 to 39.9 gravity	1.21
40 to 40.9 gravity	1.26
41 to 41.9 gravity	1.31
42 to 42.9 gravity	1.36
43 to 43.9 gravity	1.41
44 and above	1.46

CARSON-HUTCHINSON COUNTIES
(Humble Oil and Refining Company, Magnolia Petroleum Company and Gulf Pipe Line Company)

Below 32 gravity	.69
32 to 32.9 gravity	.76
33 to 33.9 gravity	.81
34 to 34.9 gravity	.86
35 to 35.9 gravity	.91
36 to 36.9 gravity	.96
37 to 37.9 gravity	1.01
38 to 38.9 gravity	1.06
39 to 39.9 gravity	1.11
40 to 40.9 gravity	1.16
41 to 41.9 gravity	1.21
42 to 42.9 gravity	1.26
43 to 43.9 gravity	1.31
44 and above	1.36

WEST TEXAS
(Humble, Gulf, Magnolia, The Marland Company and Southern Crude Oil Purchasing Company)*

Crane-Upton, Crockett, Pecos and Winkler Counties, all grades	.65

*Gulf does not post in Winkler County; Magnolia posts in Crane, Upton and Winkler Counties and that part of Glasscock not included in the Chalk field. The Marland Company posts only in Crane, Upton and Crockett Counties; Southern posts only in Crane, Upton and Winkler Counties.

(Magnolia Petroleum Company)

Mitchell County	$ .80
Howard-Glasscock County (shallow)	.80
Howard-Glasscock County (deep)	.65

Col-Tex Refining Company

Howard and Mitchell Counties	$ .80

WYOMING-MONTANA
Wyoming

Byron	1.33
Ferris	1.60
Elk Basin	1.48
Grass Creek	1.48
Rock Creek	1.33
Lost Soldier	.95
Lance Creek	1.48
Mule Creek	1.10
Notches	.65
Big Muddy	1.33
Osage	1.33
Hamilton Dome	.85
Pilot Butte	1.75
Torchlight-Greybull	1.33
Lander	.80
Simpson Ridge	.80
Rex Lake	1.10
South Casper Creek-Poison Spider	1.00

Salt Creek
Midwest Refining Company

29 to 29.9 gravity	1.14
30 to 30.9 gravity	1.16
31 to 31.9 gravity	1.18
32 to 32.9 gravity	1.20
33 to 33.9 gravity	1.22
34 to 34.9 gravity	1.24
35 to 35.9 gravity	1.26
36 to 36.9 gravity	1.28
37 and above	1.30

MONTANA

Sunburst	$1.65
Cat Creek	1.33
Lake Basin	2.20

NEW MEXICO

	Dec. 4 1928
Artesia	1.08
Hogback	1.38

CANADA

Oil Springs	2.07
Petrolia	2.00

NORTH LOUISIANA
(The Texas Company)

24 to 24.9 gravity	.76
25 to 25.9 gravity	.81
26 to 26.9 gravity	.86
27 to 27.9 gravity	.91
28 to 28.9 gravity	.96
29 to 29.9 gravity	1.01
30 to 30.9 gravity	1.06
31 to 31.9 gravity	1.11
32 to 32.9 gravity	1.16
33 to 33.9 gravity	1.19
34 to 34.9 gravity	1.22
35 to 35.9 gravity	1.25
36 to 36.9 gravity	1.28
37 to 37.9 gravity	1.31
38 to 38.9 gravity	1.34
39 to 39.9 gravity	1.37
40 to 40.9 gravity	1.40
41 to 41.9 gravity	1.43
42 to 42.9 gravity	1.46
43 to 43.9 gravity	1.49
44 to 44.9 gravity	1.52
45 to 45.9 gravity	1.55
46 to 46.9 gravity	1.58
47 to 47.9 gravity	1.61
48 to 48.9 gravity	1.64
49 to 49.9 gravity	1.67
50 to 50.9 gravity	1.70
51 to 51.9 gravity	1.73
52 and above	1.76

LOUISIANA-ARKANSAS
Homer, Haynesville, Caddo, El Dorado, De Soto and Crichton and Cotton Valley**
(Atlantic Oil Producing Company, Standard of Louisiana, Magnolia Petroleum Company and The Texas Company).

	Dec. 4 1928
27 to 27.9 gravity	.81
28 to 28.9 gravity	.88
29 to 29.9 gravity	.95
30 to 30.9 gravity	1.02
31 to 31.9 gravity	1.09
32 to 32.9 gravity	1.16
33 to 33.9 gravity	1.21
34 to 34.9 gravity	1.26
35 to 35.9 gravity	1.31
36 to 36.9 gravity	1.36
37 to 37.9 gravity	1.41
38 to 38.9 gravity	1.46
39 to 39.9 gravity	1.51
40 to 40.9 gravity	1.56
41 to 41.9 gravity	1.61
42 to 42.9 gravity	1.66
43 to 43.9 gravity	1.71
44 gravity and above	1.76

*Shreveport-Eldorado's postings stop at above 40 gravity.

**Below 36 gravity, the posting on Cotton Valley is 75 cents. From 36 to 52 and above the regular gravity schedule is followed.

STEPHENS
(All Companies)

Below 28 gravity	.75
28 to 28.9 gravity	.79
29 to 29.9 gravity	.83
30 to 30.9 gravity	.87
31 to 31.9 gravity	.91
32 gravity and above	.95

SMACKOVER
(All Companies)

Below 24 gravity	.75
24 and above	.90
Bellevue	1.25
Jennings	1.15
Vinton	1.30
Edgerly	1.30
Starks Dome	1.30
Urania	.85
Calion	.75

IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS
American Petroleum Institute Figures (Barrels of 42 gallons)

	Weew Ended Nov. 24	Week Ended Nov. 17
AT ATLANTIC COAST PORTS—		
Baltimore	184,000	108,000
Boston	71,000	145,000
New York	1,245,000	*861,000
Philadelphia	340,000	267,000
Others	.....	.....
Total	1,840,000	1,381,000
Daily Average	262,857	197,285
AT GULF COAST PORTS—		
Galveston District	40,000	.....
New Orleans and Baton Rouge	93,000	206,000
Port Arthur and Sabine District	139,000	.....
Tampa	.....	.....
Total	272,000	206,000
Daily Average	38,857	29,429
AT ALL UNITED STATES PORTS—		
Total	2,112,000	1,587,000
Daily Average	301,714	226,714
Daily Average Four Weeks Ended	255,786	239,714

RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS
American Petroleum Institute Figures (Barrels of 42 Gallons)

	Weew Ended Nov. 24	Week Ended Nov. 17
AT ATLANTIC COAST PORTS—		
Baltimore	148,000	146,000
Boston	.....	*76,000
New York	148,000	362,000
Philadelphia	158,000	80,000
Others	.....	.....
Total	454,000	664,000
Daily Average	64,857	94,857
AT GULF COAST PORTS	.....	.....
Daily Average	.....	.....
TOTAL—ATLANTIC AND GULF COAST PORTS	454,000	664,000
Daily Average	64,857	94,857
Daily Average Four Weeks Ended	67,536	61,500
Distribution of Total California Oil Receipts is as folows:		
Crude	.....	.....
Gasoline	382,000	602,000
Gas Oil	72,000	62,000
Total	454,000	664,000

*Revised.

Both—on the *Bottom* of the Well

McEVOY WIRELESS WELL STRAINERS and SET SHOE ASSEMBLIES for Bottom of Well.

Made with NON-CORROSIVE BRASS STRAINER PLUGS, as well as with the NEW Steel Case-Hardened, Heat-Treated Strainer Plugs against Sand Cutting.

(Patented)

McEVOY FLUSH JOINT STRAINERS are indispensable for Side-Tracking or Whip-Stocking Jobs, or for Crooked Holes . . . as they have no couplings to hang.

(Patented)

McEVOY WELL STRAINER with set shoe assembly and packer equipped for double string well.

(Patented)

McEVOY WELL STRAINER with set shoe assembly equipped for single string well.

and—the *Top* of the Well McEVOY Products are Dependable

Oil Field Operators, the world over, have found from their own experience that they can depend on McEVOY PRODUCTS . . . . because they have been developed and perfected through 28 YEARS of experience fighting oil field "grief."

McEvoy Casing and Tubing Control Heads for Top of Well.

(Patent Applied for)

Above shows detail of body and cap with removable stuffing box, glands, and cap, as well as adapter, and slips as frequently used for the smaller sizes of tubing. Oil savers may be connected to the bottom of adapters for tubing up to 3". Slips are made for pipe, tubing, or casing from 2" to 6⅜" and the heads are made in four sizes to fit pipe and casing from 4½" to 12½" inclusive.

J. H. McEVOY & COMPANY

HOUSTON, TEXAS, U.S.A.

Pacific Coast Branch: McEVOY SCREEN PIPE CO., 2428 E. 56 St., Los Angeles, Calif.

United States Daily Average Production

Figures below are taken from the complete revised estimates of the AMERICAN PETROLEUM INSTITUTE except for the current week, which are advance estimates issued by the A. P. I. and are subject to revision:

1927	Oklahoma	Kansas	Texas (Outside Gulf Coast)	Gulf Coast	North Louisiana	Arkansas	Eastern States	Rocky Mountain	California	United States Daily Ave.	United States Total
September	797,450	105,200	493,750	142,900	53,450	101,350	110,800	74,500	637,250	2,516,650	75,498,900
October	782,300	105,100	497,900	138,400	51,300	100,450	113,600	73,250	629,000	2,491,300	77,230,000
November	766,900	106,650	501,750	138,100	49,400	97,850	114,900	75,050	623,850	2,474,450	74,233,500
December	720,700	106,150	531,650	138,500	47,200	94,950	111,250	77,150	624,600	2,452,150	76,017,050
1928											
January	675,450	108,300	523,300	125,450	45,250	90,050	109,600	77,000	617,100	2,371,500	73,516,500
February	664,450	110,550	538,750	115,800	45,300	88,250	104,850	75,550	614,750	2,358,250	68,388,850
March	646,850	112,250	575,850	119,900	44,400	85,600	102,150	78,700	617,450	2,383,150	73,877,650
April	620,450	112,150	617,850	118,850	46,900	83,450	107,000	78,500	613,550	2,398,700	71,961,100
May	610,100	108,750	561,450	129,850	43,600	91,250	112,100	82,200	630,900	2,370,200	73,476,300
June	594,850	105,200	554,400	135,400	42,350	102,850	109,300	82,400	643,400	2,370,150	71,104,500
July	587,150	102,750	597,250	133,650	42,150	90,700	113,400	80,400	644,700	2,392,150	74,156,600
August	656,350	102,200	604,000	130,200	40,200	87,500	113,300	77,700	634,150	2,445,600	75,534,600
September	724,850	99,750	604,150	129,500	39,050	84,700	112,550	78,850	631,650	2,505,050	75,151,500
October	741,350	97,900	598,550	129,950	38,800	83,550	114,000	83,300	624,450	2,511,850	77,867,800
Nov. 3	725,450	96,950	589,900	136,850	38,150	83,300	113,000	82,550	631,000	2,497,150	17,480,050
Nov. 10	721,100	96,700	584,750	138,000	39,400	83,200	111,000	83,850	639,000	2,497,000	17,479,000
Nov. 17	715,100	96,000	588,700	134,500	38,750	83,400	109,000	81,900	645,000	2,490,850	17,435,950
Nov. 24	712,950	96,300	586,950	134,550	38,200	83,050	107,500	79,700	665,800	2,505,000	17,535,000
Dec. 1	708,600	97,250	582,950	132,150	38,200	82,100	110,000	78,100	676,800	2,506,150	17,543,050
Increase	.....	950	.....	.....	.....	.....	2,500	.....	11,000	1,150	8,050
Decrease	4,350	.....	4,000	2,400	.....	950	.....	1,600	.....	.....	.....

TEXAS

(Outside Gulf Coast)

PANHANDLE DISTRICT

	Dec. 1	Nov. 24
Carson County	6,100	6,100
Gray County	23,900	25,500
Hutchinson County	28,100	28,900
Wheeler County	800	800
Others	2,700	2,900
Total	61,600	64,200

NORTH TEXAS

Archer County	19,250	19,400
Burkburnett	9,950	9,850
Electra	12,800	12,750
Iowa Park-KMA	3,850	3,800
Montague and Cooke Cos.	10,050	10,200
Wilbarger	32,650	32,800
Others	600	600
Total	89,150	89,400

WEST CENTRAL TEXAS

Brown County	10,150	10,300
Callahan County	3,850	3,700
Coleman County	3,900	3,950
Eastland-Desdemona	6,950	7,000
Jack County	1,300	1,300
Palo Pinto County	350	350
Shackelford County	10,550	10,450
Stephens County	7,550	7,650
Throckmorton County	800	800
Young County	8,750	8,650
Others	700	700
Total	54,850	54,850

WEST TEXAS

Crane-Upton Counties	54,000	53,900
Crockett County	2,850	2,850
Howard County	33,000	31,050
Jones County	5,000	3,450
Mitchell-Scurry Cos.	2,750	2,700
Pecos County	70,400	67,900
Reagan County	17,200	17,200
Winkler County	141,200	149,150
Others	1,450	1,400
Total	327,850	329,600

EAST CENTRAL TEXAS

Boggy Creek	1,700	1,900
Corsicana-Powell	10,000	9,600
Currie	500	550
Mexia	6,350	6,400
Nigger Creek	700	700
Richland	500	800
Wortham	1,500	1,500
Total	21,250	21,150

SOUTHWEST TEXAS

Dale	850	850
Laredo District	8,950	8,850
Luling	13,500	13,450
Lytton Springs	1,150	1,150
Somerset	700	700
Salt Flat	2,300	2,000
Others	800	750
Total	28,250	27,750
T'tl Tex. (Outside Gulf Coast)	582,950	586,950

TEXAS GULF COAST

Barbers Hill	650	1,000
Batson	1,350	1,300
Big Creek	1,800	2,050
Blue Ridge	5,700	6,200
Boling	2,900	2,950
Damon Mountd	1,000	1,250
Goose Creek	6,750	6,600
Hull	10,750	11,000
Humble	3,750	3,800
Orange County	3,450	3,550
Pierce Junction	10,650	9,750
Saratoga	950	950
Sour Lake	3,000	3,200
South Liberty	5,900	5,800
Spindle Top	35,500	37,500
Sugar Land	4,800	4,850
West Columbia	8,000	8,500
Others	2,850	3,150
Total	109,750	113,400
Texas Total	692,700	700,350

OKLAHOMA

North Braman	2,700	2,700
South Braman	1,350	1,350
Blackwell	3,050	3,050
Hubbard	2,350	2,350
Thomas	1,100	1,100
Tonkawa	11,750	11,800
Garber	7,100	7,100
Burbank	25,300	25,650
Osage (outside Burbank)	26,000	26,000
Cushing	20,000	20,050
Yale Jennings	7,650	7,600
Davenport	1,650	1,700
Bristow Slick	20,200	20,200
North Okmulgee	14,400	14,400
Lyons Deaner	4,250	4,300
Cromwell	8,150	8,450
Papoose	4,000	4,000
Wewoka	5,400	5,400
Seminole	40,900	41,750
Bowlegs	48,900	50,650
Searight	10,150	10,250
Little River	100,650	105,450
Earlsboro	75,300	75,850
Duncan District	7,750	7,750
Graham	4,750	4,750
Fox	1,600	1,600
Healdton	13,700	13,650
Hewitt	9,000	9,000
Scholem Alechem	14,500	14,400
Pearson	1,900	2,050
St. Louis	132,150	130,050
Allen	24,900	24,100
Others	56,050	54,450
Total	708,600	712,950

CALIFORNIA

Santa Fe Springs	70,500	66,000
Long Beach	192,000	192,500
Huntington Beach	51,000	51,500
Torrance	16,000	16,000
Dominguez	10,000	10,000
Rosecrans	6,500	5,500
Inglewood	27,800	28,000
Midway-Sunset	75,000	75,000
Ventura Avenue	52,000	52,000
Seal Beach	28,500	26,000
Others	147,500	143,300
Total	676,800	665,800

KANSAS

Greenwood County	25,500	25,600
Florence-Covert	1,000	1,000
Peabody-Ebling	3,250	3,250
Eldorado-Towanda	12,900	12,900
Augusta-Fox Bush	3,200	3,200
Rainbow Bend	1,300	1,300
Russell	4,000	4,000
Churchill	7,700	8,100
Oxford	7,100	7,550
Others	31,300	29,400
Total	97,250	96,300

NORTH LOUISIANA

	Dec. 1	Nov. 24
Homer	4,100	4,100
Haynesville	5,800	5,800
Caddo Light	9,350	9,150
Caddo Heavy	2,950	3,000
DeSoto-Red River	4,150	4,050
Elm Grove	600	600
Bellevue	850	900
Cotton Valley	3,850	3,900
Urania	6,050	6,200
Pleasant Hill	500	500
Totals North Louisiana	38,200	38,200

LOUISIANA GULF COAST

Bayou Boullion	500	600
East Hackberry	5,250	5,400
Edgerly	800	800
Evangeline	900	900
Lockport	3,900	4,200
Sorrento	550	550
Sulphur Dome	4,000	2,000
Sweet Lake	1,350	1,500
Vinton	4,200	4,200
Others	950	1,000
Total Louisiana Gulf Coast	22,400	21,150
Louisiana Total	60,600	59,350

ARKANSAS

El Dorado	4,950	4,950
Champagnolle	12,250	13,050
Smackover Light	7,150	7,150
Smackover Heavy	53,650	53,750
Stephens	1,000	1,000
Nevada	1,300	1,350
Lisbon	1,700	1,700
Others	100	100
Total	82,100	83,050

MOUNTAIN STATES

WYOMING

Salt Creek	35,400	35,350
Grass Creek	2,350	2,300
Elk Basin	1,000	1,000
Big Muddy	2,550	2,600
Lost Soldier	3,650	3,650
Rock River	2,500	2,500
Lance Creek	350	350
Others	5,500	6,000
Oregon Basin	3,500	4,350
Total	56,800	58,100

MONTANA

Cat Creek	1,500	1,500
Sunburst	7,950	7,950
Others	100	100
Pondera	2,000	2,000
Total	11,550	11,550

COLORADO

Moffats (Craig)	1,250	1,250
Fort Collins	2,250	2,300
Florence	1,250	1,200
Others	2,300	2,350
Total	7,050	7,100

NEW MEXICO

Table Mesa	...	250
Artesia	1,050	1,050
Hogback	500	500
Rattlesnake	1,050	900
Others	100	250
Totals	2,700	2,950
Totals Mountain States	78,100	79,700

EASTERN STATES

(Including Ill., Ind., Ohio, W. Va., Pa., Ky., and N. Y.)	110,000	107,500

PRODUCTION SUMMARY

East of Rockies	1,751,000	1,759,500
Total U. S.	2,506,150	2,505,000

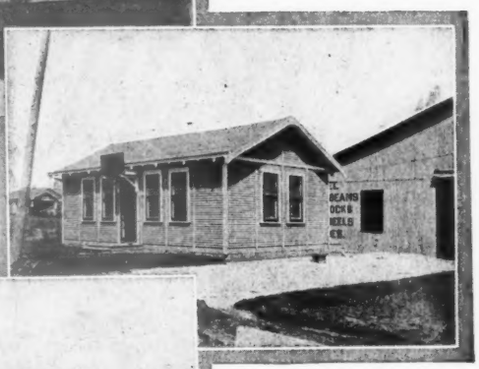
"STURDYBILT" SECTIONAL HOUSES

Save Money for the Oil Industry with an Actual 100 Per Cent Salvage Value

"STURDYBILT" SECTIONAL HOUSES are a realization of the Oil Industry's need for substantial housing facilities at low cost of initial construction and high salvage value.

"STURDYBILT" SECTIONAL HOUSES, adaptable to the peculiar needs of the Oil Industry for oil field lease, pipe line station or refinery use, are designed to afford the utmost in housing accommodations as well as low initial cost, quick construction and 100 PER CENT SALVAGE VALUE.

No. 413. Five-room "Sturdybilt" residence



No. 304. A "Sturdybilt" field office

No. 502. Five-room "Sturdybilt" lease house

Right—No. 504. Six-room "Sturdybilt" residence

Left—No. 202. Two-room "Sturdybilt" lease office

No. 411. Four-room "Sturdybilt" lease house with screened porch.

No. 801. "Sturdybilt" bunk house and dining hall

No. 51. "Sturdybilt" two-car garage

It is conservatively estimated that in the Mid-Continent field alone the Oil Industry has a "dead" investment of well over a Million Dollars in standard constructed houses which could have been reclaimed had "STURDYBILT" SECTIONAL HOUSES been used instead.

For Seven Years "STURDYBILT" SECTIONAL HOUSES have been the leader in section-built houses for Oil Industry usage . . . their comparative value will endure over all other specifications with their actual 100 PER CENT SALVAGE VALUE against the low or absolute lack of salvage value of other types of oil field housing construction.

Descriptive Booklet on Request

SOUTHERN MILL & MFG. CO.

Manufacturers of "Sturdybilt" Sectional Houses

TULSA, OKLAHOMA

COMPLETIONS FOR PAST WEEK IN U.S. FIELDS

SUMMARIZED REVIEW OF FIELD RESULTS

State—	Completions This Week	Completions Last Week	Producers This Week	Producers Last Week	Gas Wells This Week	Gas Wells Last Week	Failures This Week	Failures Last Week	Initial Production This Week	Initial Production Last Week
Arkansas	10	1	4	..	..	..	6	-	763	...
California	21	17	20	16	..	..	1	1	23,495	32,450
Illinois	3	..	2	..	..	..	1	..	29	...
Indiana	4	4	1	..	2	3	1	1	16	...
Kansas	11	46	8	20	1	3	2	23	595	3,182
Kentucky	27	32	16	22	1	1	10	9	845	360
Louisiana	22	23	2	8	8	3	12	12	3,300	3,445
Michigan	7	2	3	2	2	..	2	..	1,700	60
New York	23	20	9	20	10	..	4	..	18	67
Ohio	42	41	21	16	16	18	5	7	172	128
Oklahoma	74	68	43	38	7	6	24	24	20,476	10,900
Pennsylvania	49	100	40	85	3	10	6	5	589	243
Texas	112	125	50	72	10	9	52	44	19,094	26,915
West Virginia	..	13	..	..	..	10	..	3	...	...
Total	405	492	219	299	60	63	126	130	71,092	77,750
Increase this week	..	..	..	..	..	..	..	..	...	...
Decrease this week	87	..	80	..	3	..	4	..	6,658	...

KANSAS

Company, Well and Location	Initial Production Bbls.	Depth
BUTLER COUNTY—		
Garden et al, Sluss 2 "B", csl ne nw, 6-27-6e	20	2745
ELK COUNTY—		
Derby Oil Co. and Frazier, Sawyer 1, ne nw sw, 10-31-10e	100	2009
Sherman et al, Armstrong 2, swc nw, 10-31-10e	125	2018
Wakefield et al, Sawyer 1, sw se nw, 10-31-10e	15	2012
FRANKLIN COUNTY—		
Haworth and Howard, Barton 1, c nw se, 25-16-17e	¶1¼	1235
Case 1, c se se, 25-16-17e	*	1200
GREENWOOD COUNTY—		
Empire O. & R. Co., Edwards 9, nw sw ne, 21-23-11e	100	1933
Phillips Pet. Co., Mead 1 nec nw 35-23-11e	175	1861
Skelly Oil Co. et al, Inthurm 3, c s/2 ne, 4-23-13e	10	1727
Mohawk Oil Co., Grundy 3, nw se nw, 7-27-11e	50	1889
Simmons and Amerada, Ellis 6, swc se, 26-23-11e	*	2010

OKLAHOMA

Company, well and Location	Initial Production Bbls.	Depth
BECKHAM COUNTY—		
Magnolia, Ensley 1, c sw se, 21-9-23w	¶21	2750
CARTER CONUTY—		
Roxana, Lyles 3, se sw nw, 11-2s-3w	96	3531
CREEK COUNTY—		
J. E. Wallace, McComas 1, cwl nw nw 2-17-11e	¶2	1982
Houston Oil Co., Bullett 2, nw se ne, 20-17-7	240	2810
Shaffer O. & R. Co., Tiger 18, nec sw nw, 17-17-7e	125	2733
C. H. Lebow, Tiger 16, swc ne nw, 17-17-7e	165	2744
Sinclair O. & G. Co., Morton 1, nwc sw se, 27-14-10e	*	3623
Sapulpa Fuel Co., Glover 1, c se ne, 6-17-11e	*	2357
A. B. Ice et al, Johnson 1, nwc se sw, 28-18-11e	*	2355
Dixie Drilling Co., Pahcohney 2, owdd, c se nw, 28-18-11e	*	2492
CADDO COUNTY—		
Magnolia, Moss 3, nec nw sw, 5-5-9w	10	2418
COMANCHE COUNTY—		
Magnolia, Price 2, se sw ne, 30-2-9w	7	2150
COTTON COUNTY—		
C. E. Crane, Sturgeon 1, c nw ne, 33-2s-9w	*	3505
GRADY COUNTY—		
Oklahoma Gas Utilities Co., Farwell 14, sw nw sw, 26-5-8w	¶17	2350
GRANT COUNTY—		
Argo Oil Co., Swaggert 2, sec, 15-27-3w	25	3995
JEFFERSON COUNTY—		
Dye and Fritz, Barrett 1, c se se, 5-6s-7w	*	2270
LINCOLN COUNTY—		
Texas Pacific Coal & Oil Co., Long 3, sw ne se, 31-17-5e	12	4214
MUSKOGEE COUNTY—		
A. Wasaff, Henson 3, nec sw se sw, 3-14-18e	*	1202
C. D. Bradley, Cordrey 1, nec se ne, 21-15-19e	*	1078
OKFUSKEE COUNTY—		
F. D. Misener, Bird 1, nwc ne, 21-10-11e	*	1712
Atlantic, Robinson 2, cwl nw sw, 12-10-11e	75	2027
W. L. Umburn, Simmer 5, csl n/2 ne se, 11-10-11e	75	2038
Champlin O & R. Co., Jacobs 11, sw c se se, 15-11-11e	300	3485
OKMULGEE COUNTY—		
Kirkland & Son, Phillips 3, sec nw, 19-15-13e	12	1630
L. C. Wheeler et al, Cornelius 1, swc ne ne, 35-15-12e	¶5	2270
Unger Bros., Sells 2, cnl nw ne, 25-15-14e	*	2310
Devonian Oil Co., Campbell 1, nec nw nw, 19-15-14e	*	2471
Kirkland & Son, Doyle 1, c sw ne, 19-15-13e	*	2216
Moffitt et al, Hawkins 7, owdd, csl sw se, 6-11-12e	*	2350
J. L. Brock et al, Holleyman 1, sec nw, 25-13-12e	*	3052
W. C. Newman and Atlantic, Kemp 1, sec nw, 8-13-11e	*	3228
A. G. Hazlett et al, Haskins 1, cnl sw sw, 27-16-12e	*	2600
OSAGE COUNTY—		
Peters Pet. Co., 1, nec se se, 8-21-9e	*	435
Bement Oil Corp., 6, nec sw se, 10-25-8e	*	1014
Clint Moore Est., 17, swc se sw sw, 9-21-9e	20	299
PAWNEE COUNTY—		
Thompson & Black, Lenox 2, nwc sw sw, 14-20-9e	¶1½	960
Mowrey, Welch & Carson, Rogers 1, swc nw, 15-21-7e	*	2911
PAYNE COUNTY—		
Producers & Refiners Corp., Goss "B" 1 nwc se sw, 7-18-5e	50	2823
PONTOTOC COUNTY—		
Lasalle Oil Co., Mole 1, sec 30-5-5e	75	2638
The Texas Co., Lucy 4, nwc ne, 19-5-8e	1262	2660
Texas Pacific Coal and Oil Co., Hutcheon 3, sec, 19-5-8e	*	1420
POTTAWATOMIE—		
Shaffer O. & R. Co., Phillips 2, owdd, nwc sw, 19-7-4e	*	4357
Gypsy Oil Co., Hunick 2, swc se, 5-9-5e	990	4530
Mid-Continent Pet. Corp., Rogers 1, sec sw, 5-9-5e	1190	4597
Magnolia, School Land 2, ne se nw, 36-7-3e	30	3975
Haldton O. & G. Co., Thompson 1, sw nw nw, 20-7-4e	125	4259
Independent O. & G. Co. and Darby Pet. Co., Freid 3, sw ne ne, 23-7-4e	35	4532
Magnolia, Cherry 1, ne se ne, 26-7-4e	5577	4285
Yants 3, sw ne sw, 19-7-5e	291	4240
Pure Oil Co., Thrailkill 1, swc nw, 19-7-5e	220	3869
T. B. Slick, Youts 4, nw se sw, 19-7-5e	960	4286
Magnolia, Fyke "D" 2, nw ne nw, 29-7-5e	66	4395
Sinclair O. & G. Co., Nadash 3, nw sw nw, 29-7-5e	220	4245
Nadash 5, nwc sw, 29-7-5e	285	4399
Gypsy Oil Co., Stahl 4, sw ne ne, 30-7-5e	840	4432
Independent O. & G. Co., Blandin 3, nw ne sw, 30-7-5e	457	4225
Blandin 4, ne nw sw, 30-7-5e	25	4399
Blandin 5, se ne sw, 30-7-5e	825	4254
Blandin 6, sw nw sw, 30-7-5e	32	4351
Phillips Pet. Co., Stahl 1, nwc ne, 30-7-5e	135	4275
Stahl 4, se nw ne, 30-7-5e	512	4238
Shaffer O. & R. Co., Tolon 1, ne se sw, 30-7-5e	1627	3820
T. B. Slick, Lynn 1, nec nw, 30-7-5e	740	4259
Lynn 3, sw ne nw, 30-7-5e	202	4240
Smith 1, nwc se, 30-7-5e	95	4344
SEMINOLE COUNTY—		
Gypsy Oil Co., Sango 14, sw ne se, 1-9-5e	40	4465
Carter Oil Co., Larney 3, ne nw nw, 24-7-6e	735	4418
Pure Oil Co., Brinson 1, sw nw sw, 24-7-6e	1405	4394
SEMINOLE COUNTY—		
Twin State Oil Co., Jones 4, nec se 11-8-6e	*	3854
Carter Oil Co., Harjo 2, sw se sw, 11-7-6e	*	4521
STEPHENS COUNTY—		
Atlantic, Taylor 1, swc nw, 12-1s-4w	268	3604
TULSA COUNTY—		
S. W. Anthony, Whitstone 3, nwc ne sw, 3-16-12e	¶2	1927
WAGONER COUNTY—		
J. P. Duke et al, Brown 1, nec sw nw, 36-16-17e	¶3½	850

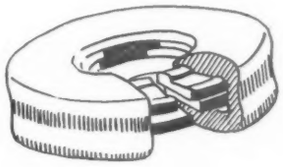
CALIFORNIA

Company, Well and Location	Initial Production Bbls.	Depth
ATHENS-ROSECRANS—		
Barnsdall Oil Co., O'Dea 13, wo	2100	5405
BELRIDGE—		
Berry Oil Co., No. 231, 30-28-21	75	675
Ohio Oil Co., No. 20, 30-22-21	50	700
KERN FRONT—		
General Pet. Corp., Wetmore 13, 14-28-27	100	2025
LONG BEACH—		
California-Eastern Oil Co., Marine 26	1500	7300
The Petroleum Co., Beck 3	1700	6095
Shell Co., Dobyns 7	300	7515
Hutton 9	2100	7501
Marcellus 6	900	7015
Martin 6	1700	7475
Fee 4	300	7990
Joseph Seaple, Maltby 3	3800	6610
Signal Syn., No. 8	400	6730
Texas Co., Foster 1-4	2400	6340
RICHFIELD—		
Biltmore Oil Co., Atwood 1	750	4350
RINCON—		
Richfield Oil Co., U. S. 1	125	4175
SANTA FE SPRINGS—		
Universal Consolidated Oil Co., Blanchard 6	2700	5775
Wilshire Oil Co., Cecelia 1-B	3900	5795
SEAL BEACH—		
Marland Oil Co., Bixby 24	700	4825
George F. Getty, Inc., Fee 2, wo	100	6885

The NEW SWITZER RUBBER-CROWN METALLIC PACKING

Four metallic inserts are seated around the rod in a perfect, self adjusted circle. The rubber housing is next to the gland. The soft metallic inserts next to the rod make a perfect packing. In ordering Switzer Rubber Crown Metallic Packing be sure to give us your rod size and gland dimensions.

Any further information will be gladly given on request.



This drawing shows the placing of the four metallic inserts in the rubber crown, which when under pressure makes an absolute liquid and air tight packing which positively prevents the least escapage.

A NEW, high efficiency packing, specially designed for handling steam, water, air, oil, gasoline, ammonia, caustic soda, lye, gas,—in fact an all purpose packing for all substances at any pressure.

This new packing does not require setting-up tight with a wrench; is designed to adjust itself to worn rods; and is guarantteed not to score rods.

SPECIALLY DESIGNED RUBBER CROWN

The rubber crown, in which is encased the four metallic washers is a special heat resisting, long life rubber, perfected and designed especially for this packing. This packing will withstand a temperature of 650° F. without softening or tearing. There are instances where it has not been necessary to replace it even after eighteen months of continuous service.

OIL FIELD SUPPLIES

In our branch stores throughout the Gulf Coast region, are large stocks of equipment of practically every standard and well known make. Each of these stores is a complete supply house in itself and can render you fast efficient service on whatever supplies you need.

SEND US YOUR ORDERS.

"KNOWLEDGE"

T.T.WORD SUPPLY CO.

OF OIL FIELD PROBLEMS AND EQUIPMENT

HOUSTON, TEX. SHREVEPORT, LOUISIANA. LAKE CHARLES LA.

EASTERN STATES

PENNSYLVANIA

Company, Well and Location	Initial Production Bbls.	Depth
BRADFORD FIELD—		
Forest Pet. Corp., Drake L-63	2	....
Drake L-69	2	....
Drake L-76	2	....
Drake L-77	2	....
Drake L-86	2	....
Drake L-89	2	....
Davis Oil Corp., Davis 19	3	....
Burns 13	3	....
South Penn Oil Co., Burdick 60	2	....
Zook & Sloan, Potter F-11	2	....
Potter D-5	2	....
Potter E-2	2	....
Potter I-12	2	....
F. A. Wile & Co., Franchot 2	2	....
Thomas T. Fox, Franchot 2	2	....
J. A. Walters Est., Walters 10	3	....
Pressure Oil Co., Doubleday 2	2	....
Sarah Sprague, Sprague 3	3	....
H. P. McKalip & Co., Bingham 8	3	....
G. C. Rice & Co., Weston 4	2	....
Penn Pet. Co., Duke 32	4	....
Minich Bros., Minich 2	3	....
A. Williams, Borden 3	3	....
L. M. Lilly & Co., Middaugh 29	3	....
T. H. Kennedy, Kennedy 6	3	....
G. W. Smith & Co., Smith 1	*	....
North Branch Oil Co., North Branch 7	*	....
N. V. V. Franchot, Rounds 21	*	....
BUTLER COUNTY—		
Phillips Oil & Gas Co., McFarland 1	500	....
D. Dierken, Dierkin 4	2	....
James Sherwin, Sherwin 7	*	....
Sammis & Co., Buehler Heirs 1	2	....
Miller & Gould, Marshal 36	2	....
Young Bros., Gillespie 4	2	....
Little Four Oil Co., Dulity 2	2	....
VENANGO COUNTY—		
Weekly & Helscil, Porter 5	2	....
Porter 6	2	....
Thorn & Irwin, Hovis 16	2	....
Witherup & Co., HcElphatrick 24	2	....
F. H. McKean, Douitt 12	2	....
Z. T. Call, Call 25	2	....
Crawford, Gregory & Co., P. & T. 21	2	....
E. A. Bream, McConnell Heirs 6	2	....
S. & G. Gas Co., Hydinger 1	¶¼	....
N. T. Shortset & Co., Rapp 3	*	....
S. N. Reagle, Reagle 15	2	....
GREENE COUNTY—		
E. W. Maple & Co., Maple 1	¶1½	....
Staggers O. & G. Co., Staggers 1	¶1¼	....

NEW YORK

Company, Well and Location	Initial Production Bbls.	Depth
ALLEGANY COUNTY—		
C. C. Breman & Co., Breman 1	2	....
J. B. Gray, Gray & Smith 1	2	....
First Nat. Bank of Olean, Birtcil 19	2	....
J. A. Bucher, Bucher 7	2	....
F. L. Williams, Williams 9	2	....
F. L. Putnam & Co., Putnam 11	2	....
J. W. Johnson & Co., Johnson 5	2	....
Conkling & Reeland, C. & R. 14	2	....

WEST VIRGINIA

Company, Well and Location	Initial Production Bbls.	Depth
CALHOUN COUNTY—		
F. F. McIntosh & Co., Morgan-Fox 1	2	....
United Fuel Gas Co., Umstead 1	¶14	....
F. F. McIntosh & Co., Slider 1	¶2	....
Hope Nat. Gas Co., McCoy 1	¶2	....
WETZEL COUNTY—		
Manufacturers Light & Heat Co., Matthews 1	¶1	....
Transcontinental Oil Co., Schamp 1	*	....
Myers O. & G. Co., Myers 1	¶1	....
DODRIDGE COUNTY—		
Trainer Bros., Crabtree 1	¶¼	....
HARRISON COUNTY—		
C. T. Carroll, Laman 1	¶1½	....
LINCOLN COUNTY—		
United Fuel Gas Co., Cooper 1	¶¼	....
CABELL COUNTY—		
Dunham & Titus, Guyandotte Country Club 1	¶¾	....
TYLER COUNTY—		
J. H. Pentz, Smith 1	¶1	....
RITCHIE COUNTY—		
H. H. Cogwill, McCullough 4	*	....
MARSHALL COUNTY—		
Burley & Ornoff, Teagarden 1	*	....
GILMER COUNTY—		
Hope Nat. Gas Co., Meadows 1	*	....

KENTUCKY

Company, Well and Location	Initial Production Bbls.	Depth
DAVIESS COUNTY—		
Wittmer O. & G. Co., Bryant 1	¶1½	....
Percy Jolly, Wethington 1	*	....
Jess Watts & Co., L. Howard 3	*	....
Daley & Lowman, Howard 1	*	....
Roeder & Dresser, Brown 1	*	....
Ohio Oil Co., Roby 11	*	....
The Petroleum Co., Burns 4	130	....
Burns 5	110	....
Eastern Gulf Oil Co., Ruby 3	10	....
McMahan & Co., Fuqua 3	60	....
L. C. Young & Co., Park 3	30	....
Young & Daugherty, Feldpausch 2	10	....
OHIO COUNTY—		
Dr. M. F. Sirman, Farmer 5	70	....
Farmer 6	150	....
Cumberland Petroleum Co., Hamilton 25	50	....
Hamilton 26	50	....
James C. Ellis, Gossett 7	*	....
Ohio Oil Co., Greer 2	*	604
Ellis 18	75	....
James C. Ellis, Taylor 2	*	797
Ray Bigler & Co., Roach 3	*	585
Lyle & French, Whittaker 3	30	680
J. M. Meredith & Co., Kelley Heirs 6	28	404
Leeper Oil Co., Evans 2	20	....
Chester Oil Co., Ford 1	20	....
ALLEN COUNTY—		
White Plains O. & G. Co., Oliver 31	2	353
Garley & Coatsworth, Welch 1	*	375

SOUTHEASTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
WASHINGTON COUNTY—		
Shay McMullen, Smith 1	¶¼	....
W. C. Patterson, Patterson 4	*	....
John Crum & Co., Steinhoff 3	10	....
Elmer Wickins, Wickins 5	3	....
Mendenhall & Co., Madson 1	5	....
William Huntsman & Co., Olwer 1	*	....
Charles Fickelson & Co., Schramm 5	*	....
Dean Fork Oil & Gas Co., King 8	1	1130
Ohio Fuel Gas Co., Wynn 1	2	1932
Neuhart Drilling Co., Dickson 3	¶¼	2 1753
NOBLE COUNTY—		
George Burkhart & Co., Smithberger Heirs 1	2	....
C. E. Stephens & Co., Peiszler 2	2	....
Smithberger 1	1	809
Berry & Rich, McLaughlin 3	3	1469
MONROE COUNTY—		
Mack Oil Co., Beardman 2	¶¼	1953
Sylvania Producing Co., Kinsey 16	¶¼	1931
MORGAN COUNTY—		
Rev. David Lang & Co., Hilman 1	¶¼	1423
Bauman & Co., White 1	¶½	706

NORTHWESTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
HANCOCK COUNTY—		
L. Cramer, Sol Frey 1	15	1385
ALLEN COUNTY—		
C. A. Beavy, Vore 1	10	1356
HARDIN COUNTY—		
Kurtz Gas Co., McNutt 2	¶¼	1278
SANDUSKY COUNTY—		
J. E. Bowe & Co., Bowe 1	¶¼	1231
WYANDOT COUNTY—		
Cline, Sectline & Co., Webber 1	*	....

INDIANA

Company, Well and Location	Initial Production Bbls.	Depth
GIBSON COUNTY—		
William Bell & Co., Seifers 2	16	1601
Bell Bros. & Co., Schumacher 1	*	1412
PIKE COUNTY—		
Bement Gas Co., Davidson 1	¶½	1306
Gem Oil Corp., Yeager 4	¶5	249

ILLINOIS

Company, Well and Location	Initial Production Bbls.	Depth
ST. CLAIR COUNTY—		
Ohio Oil Co., Tarlton Jr. 1	25	701
CRAWFORD COUNTY—		
Charles Karns & Co., Walters 1	4	1018
WABASH COUNTY—		
J. S. Young & Co., Collison Heirs 1	*	1560

MICHIGAN

Company, Well and Location	Initial Production Bbls.	Depth
MUSKEGON COUNTY—		
Johnson Oil & Refg. Co., Smith 2	¶5 750	2072
Kelley Goldboss, Burns 3	¶6 750	2080
Birch 1	*	2060
Bowers Oil Co., Hower 1	200	2063
Dixie Oil Co., Figgle, D-11	¶12¼	2056
Swastika O. & G. Co., Giles 1	¶10	2023
Kelley Goldboss & Co., Marquardt 1	*	3200

CENTRAL OHIO

Company, Well and Location	Initial Production Bbls.	Depth
LICKING COUNTY—		
Preston Oil Co., James Wright 8	12	728
Pure Oil Co., Phillips 1	15	2840
Settles Oil Co., Lothers 4	¶¼	813
J. A. Cashdollar, Young 1	¶1	....
ATHENS COUNTY—		
Ohio Fuel Gas Co., Gilchrist 1	¶¼	1375
Glass 2	¶¾	1687
Cole 1	¶¼	1061
Mosure & Fox, Phillips 1	¶½	1328
Kiggins & Co., Jones 3	¶¼	1540
ASHLAND COUNTY—		
Curtis & Co., Devault 5	15	....
Logan Gas Co., Albertson 1	¶½	....
H. Church, Baker 2	*	....
MUSKINGUM COUNTY—		
Whitehill Gas Co., Francis 3	50	....
Foraker & Co., Zinsmeister 1	¶1	....
HOLMES COUNTY—		
East Ohio Gas Co., Forgy 7	17	....
Ohio Fuel Gas Co., Miller 1	*	....
MEIGS COUNTY—		
Ohio Fuel Gas Co., State of Ohio 4	5	1688
Logan Gas Co., Guckler 1	¶¼	1687
PERRY COUNTY—		
R. C. Miller & Co., Ballou 2	17	3579
MEDINA COUNTY—		
Ohio Fuel Gas Co., Shank 1	10	....
LORAIN COUNTY—		
Ohio Fuel Gas Co., Lang 1	¶¼	....
WAYNE COUNTY—		
Ohio Fuel Gas Co., Kline 2	¶1	....
SUMMITT COUNTY—		
F. A. Brendall & Co., Stump 1	¶2	....
JACKSON COUNTY—		
Ohio Fuel Gas Co., Jones 2	¶1¼	2655
HOCKING COUNTY—		
Perry Stump & Co., Woodrow Heirs 1	100	....
Logan Gas Co., Engle 1	*	2865

SOUTH ARKANSAS

Company, Well and Location	Initial Production Bbls.	Depth
CLARK COUNTY—		
McKenzie Oil Co., Eakins 1, 9-11-19w	*	1700
LINCOLN COUNTY—		
Pine Prairie O. & G. Co., Carter 1, 33-10-6	*	2126
UNION COUNTY—		
Lion O. R. Co., Rowland 2, 15-17-14	13	2980
Rowland 5, 15-17-14	70	3207
Ohio Oil Co., Carroll 1, 6-17-13 2nd comp.	*	3005
Crain 4, 1-17-14	*	3174
Root Refineries, Mullins 1, 21-17-14	10	2828
Lion O. & R. Co., Nash 3, 6-17-13	670	3062

LOUISIANA

NORTH LOUISIANA

Company, Well and Location	Initial Production Bbls.	Depth
BOSSIER PARISH—		
Ark. Nat. Gas Corp., Wilkinson 1, 5-22-11	*	3068
Morgan Oil Co., Smith 2, 26-19-11	*	500
CADDO PARISH—		
Woodley Pet. Co., Whitehurst 2, 7-16-12	¶6½	2475
LA SALLE PARISH—		
Randall et al, Urania 1, (also known as Hardtner 1), 12-10-1e	*	700
MOREHOUSE PARISH—		
Natural Gas Prod. Co., Fee 1, 9-20-4e	¶10	2135
UNION PARISH—		
H. C. McDonald, Union Sawmill 1, 18-23-1e	*	2305
Moody & Seagraves, Dawkins 1, 17-20-4e	¶12¼	2140
WEBSTER PARISH—		
Virgil Helm, Maxwell 1, 7-22-9	¶9½	2680
Magnolia Pet. Co., W. P. Bond 1, 5-22-9	¶6¾	2619
Ohio Oil Co., Haynes 1, 30-23-9	*	2709
Woodley Pet. Co., Duke 2, 22-21-10	*	....

SOUTH LOUISIANA

Company, Well and Location	Initial Production Bbls.	Depth
SULPHUR—		
Union Sulphur Co., Fee 734	2000	4125
SWEET LAKE—		
Pure Oil Co., Yount-Lee 6	*	6262
SORRENTO—		
Gulf, United Lands Co. 12	1300	1650

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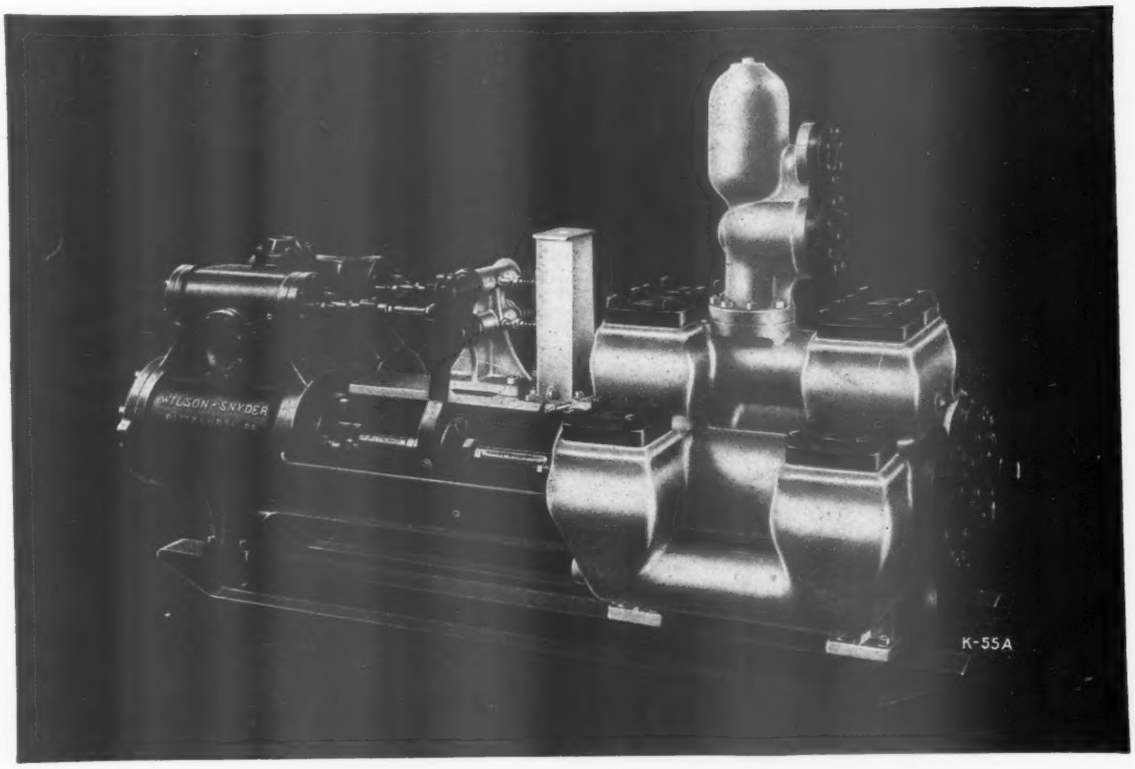
MID CONTINENT DISTRIBUTORS

The Wilson-Snyder No. 18 Slush Pump



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8¼—32lb. casing in

18 *Days*

With a No. 18 Wilson-Snyder that had previously drilled 23,000 feet of hole.

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Say you saw it in The OIL WEEKLY

TEXAS

TEXAS GULF COAST

Company, Well and Location	Initial Production Bbls.	Depth
BLUE RIDGE—		
Watts Oil Co., Scott 3	*	4615
South Texas Pet. Co., Blakely-Lee 1, wo	250	4205
Blakely & Means, Blakely 1, wo	100	3540
Navarro Oil Co., Robinson A-7	*	615
Gulf, Invincible Oil Co. 5, wo	425	3750
GOOSE CREEK—		
Gulf, Stateland-Producers 12	55	2480
HULL—		
Republic, Dolbear 102, wo	100	2180
SOUR LAKE—		
Gilbert Oil Co., Fee 105	30	740
SOUTH LIBERTY—		
Gulf Prod. Co., Chambers Fee 2	200	760
Chambers Fee 3	40	770
Sun Oil Co., Mitchell 15	1500	980

SOUTHWEST TEXAS

SALT FLAT (Bruner Feild)—		
The Texas Co., Merriweather 2	2000	2555
Date Oil Co., Hickman 1	*	2771
DUVAL COUNTY—		
The Texas Co., Hahl 1, Govt. Wells pool	200	2349
UVALDE COUNTY—		
Pure Oil Co., Smyth 1	*	4810
WEBB COUNTY—		
Houston Oil Co.-Rycade, Yeager-Strohman A-2, Albercas pool	¶20	2124
Jno. J. O'Hern, Benavides 1, Cole field	¶30	2341
O. W. Killam, Bruni 27, Albercas field	¶15	2214

EAST TEXAS

HARRISON COUNTY—		
McRitchie et al, Mrs. A. C. Baldwin 1, Fuller sur	*	2180
PANOLA COUNTY—		
D. Thomason, Crenshaw 11, Jordan sur	¶25	2660
RED RIVER COUNTY—		
Bert Longenheim, Atkinson 1, Lonson-Moore sur	*	1065

TEXAS PANHANDLE

MOORE COUNTY—		
Skelly Oil Co., Armstrong-Byrd 4	1230	3205
WHEELER COUNTY—		
Martin & Debous, Gossett 1	¶34	1633

NORTH TEXAS

ARCHER COUNTY—		
Atlantic Oil Prod. Co., Lyles 1	*	1703
J. S. Bridwell et al, Richardson 1	*	1505
L. T. Burns et al, Turbeville 1-A	*	1255
Humble O. & R. Co., L. F. Wilson 1-I	*	1500
Humble & Rayzor, Oil Inv. Co. 1	*	1502
Madden & Hunt, Richardson 11	30	1296
Richardson 1-A	*	1210
Magnolia Pet. Co., Ell Roberson 1	*	1586
Panhandle Ref. Co., White 1	*	1648
Panhandle et al, Prideaux 9	3	656
Prairie O. & G. Co., Richardson 2-E	40	1291
Rathke Oil Co., Andrews 8	3	954
The Texas Co., Wilson 1	*	1740
BURKBURNETT—		
American Ref. Properties, Fee 1	*	1250
CLAY COUNTY—		
Grubbs & Gill, Gault 1-A	*	660
ELECTRA—		
Harry Hines et al, Waggoner 11	150	1394
Magnolia Pet. Co., Maer 4-A	*	1827
Ryan Con. Pet. Corp., Nance 100	240	1384
Nance 101	250	1354
United Prod. Co., Waggoner 2	*	1330
JACK COUNTY—		
Lindsey Drlg. Co. & Pet. Prod. Co., Kuykendall 1	*	2030
K-M-A AND IOWA PARK—		
Comac Oil Co. & Prarie, Bishop 1	90	1786
Staley & Wynne, K. & K. 4	200	1482
WILBARGER COUNTY—		
Fain-McGaha, Waggoner 18-S	350	2444
Waggoner 19-S	800	2447
Phillips Pet. Co., Waggoner 2-MM	10	1847
YOUNG COUNTY—		
Dorian et al, Johnson 1	45	520
Pennell Oil Co., Johnson 7-C	3	505
Prairie O. & G. Co., Bernhardt 1	*	1050

CENTRAL WEST TEXAS

BROWN COUNTY—		
Amerada Pet. Corp., Wise 3	*	628
Cranfill & Reynolds, Eubanks 15	60	1233
Young Bros.-Alexander & Fidelity Oil Corp., Butler 1	*	1301
Eubanks et al, Eubanks 3	5	467
Grass Roots Oil Co., Klutts 5	*	540
Humphreys Bros., Inc., Bruce 1	*	1902
Moutray Oil Co., Hatchett 5	*	370
Reiter-Foster Oil Corp., Hatchett 6	15	350
Hatchett 8	40	359
Hatchett 10	10	352
Hatchett 11	15	375
Shaheen et al, Tatum 1	*	805
COLEMAN COUNTY—		
Bebout & Sullivan, Tholl Oil Co. 1	*	1602
Continental-Atlantic et al, Overall 2	140	2131
Cunningham et al, Jennings 5-C	70	1155
Duncan et al, Gholson 1	*	1085
Kingwood Oil Corp., Kemp 1	*	2855
McGahey et al, Overall 1	¶5	777
Meredith et al, Barney 1	*	1402
Ross Drilling Co., Hays 1	¶3	1148
The Texas Co., Hays 3	200	1152
EASTLAND COUNTY—		
Cranfill & Reynolds, Watson 1	*	1380
Ealy et al, Schmick 1	¶1	1598
Mays & Keath, McCord 1	*	1500
Price et al, Schmick 1	¶2	1460
Root et al, Noble 1	30	3650
Teatsorth et al, Johnson 4	¶¾-10	1785
PALO PINTO COUNTY—		
Chestnut & Smith Corp., Belding 1	*	3511
SHACKELFORD COUNTY—		
Collett et al, Newell 1	*	1672
Mid-West Explo. Co., Dyer 2	40	869
Roeser-Pendleton & Marland, Cook 28-A, (Sec. 61)	75	1262
Cook 11-A, (Sec. 62)	¶1¼	1350
STEPHENS COUNTY—		
Amerada Pet. Corp., Patton 1	*	670
Livingston & Willman, Ming 1	¶4½	3823

WEST TEXAS

CRANE COUNTY—		
Simms Oil Co. & Atlantic Oil Prod. Co., University 2-B	200	3008
HOWARD COUNTY—		
Dunigan & Hyer, Clay 2	110	1795
Louisiana Oil Ref. Corp., Settles 1	1345	2247
Marland Prod. Co., Clay 11-A	45	1793
FISHER COUNTY—		
Cranfill-Reynolds & Sun Oil Co., E. G. Young 1	*	3155
J. A. Young 2	130	3135
JONES COUNTY—		
Robert Oil Corp., et al, Smith 3	*	2505
PECOS COUNTY—		
Gulf Prod. Co., Yates 23	*	1291
Mid-Kansas-Transcontinental, Yates 4-F	55	1160
WINKLER COUNTY—		
Amerada Pet. Corp., Daugherty 1	2330	3152
Southern Crude & R. A. Westbrook, Hendrick 1-H-T-89	300	3030
Ida Hendrick 5-A-T-88	2400	2939
Ida Hendrick 2-D-T-88	2400	2706
5-B-3-T-67	725	3010
Southern & Dixie Oil Co., Hendrick		

ABREVIATIONS

NOTE—The following is the explanation of abbreviations, signs, etc., used in completion and wildcat reports: *—dry hole, abandoned well; ‡—salt water; †—junked and abandoned; ¶—million feet of gas; abn—abandoned; bbls—barrels; b.s.—basic sediment; cas casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in—inches; lcn—location; m—milling; n, s, e, w—north, south, east, west; r—reaming; sd—shut down; sdtr—sidetracking; sp—spudding; sr—straight reaming; std—standardizing; sw—salt water; td—total depth; ur—underreaming; wo—workover; wosr—waiting on standard rig.

Casper, Wyo.—The Casper offices of the Sinclair Pipe Line Company have been closed, and G. F. Beatty, who has been in charge, has been transferred to Tulsa. The Wyoming properties of the company will be in charge of H. G. Hairsha who has offices in Kearney, Nebrasko.

Depth Delays Drilling at Kettleman Hills

Coalinga, Calif.—The cost of drilling and the difficulty of putting down a 7200-foot hole are two obstacles which are being considered from every angle by the companies contemplating entry into the new Kettleman Hills field. Before the Milham Exploration Company unexpectedly brought in the discovery well, many of the major companies had had experience over a wide territory now regarded with favor. At its very best, the area looks like a 7000-foot field, especially so when it is recalled that several wells were driled far below 5000 feet without definite results.

The possibility that the field will not cover the entire area known as Kettleman Hills also is being considered. A strip 12 miles long and eight miles wide has been drilled to various depths, and it hardly seems reasonable to suppose that such an enormous acreage will be productive. The leases nearest the discovery well are considered best, although they are not necessarily nearest the center of the structure, if surface indications are a reliable criterion.

The Milham Exploration Company's Elliot 1 continues to flow in excess of 4000 barrels of 60 gravity oil, something unheard of before in California. It requires four traps to handle the gas and oil, and even then another trap would be better. The report that the well is producing chiefly gas, which condenses into gasoline in going through the traps, is gaining some favor, although official reports state that the product is nothing more than a very high gravity oil.

Santa Barbara Wildcats

Santa Barbara, Calif.—Wildcatting in Santa Barbara County has received considerable impetus, through the recent discovery of the Elwood field. The fact that the Elwood structure was known but not drilled for several years leads several companies, including the major operators, to suspect that other light oil fields may be found. The Standard Oil Company is drilling two wells, one in the Tortuga Canyon and another near Point Arquello. The Shell Company has a new location in the Refugio Canyon, while the Continental Oil Company is drilling at 2100 feet in its wildcat test near Carpenteria.

Texas Offering Oil Rights On 1,500,000 Acres

Austin, Texas.—Preparations are being made by J. T. Robison, State Land Commissioner, to offer leases on approximately 1,500,000 acres of University lands for development of oil and gas to the highest bidder through the sealed bid method on January 2, 1929. Description of the various tracts to be placed on the market are now being printed for distribution after December 1, and copies of same may be obtained by directing a request to Commissioner Robison.

Handling Plenty of Mud with GARDNER POWER PUMPS

Gardner 7¼ x 14 Enclosed Power Pumps are fast growing in favor for deep rotary drilling because they handle plenty of mud at the necessary high pressures and operate at minimum cost for power and maintenance

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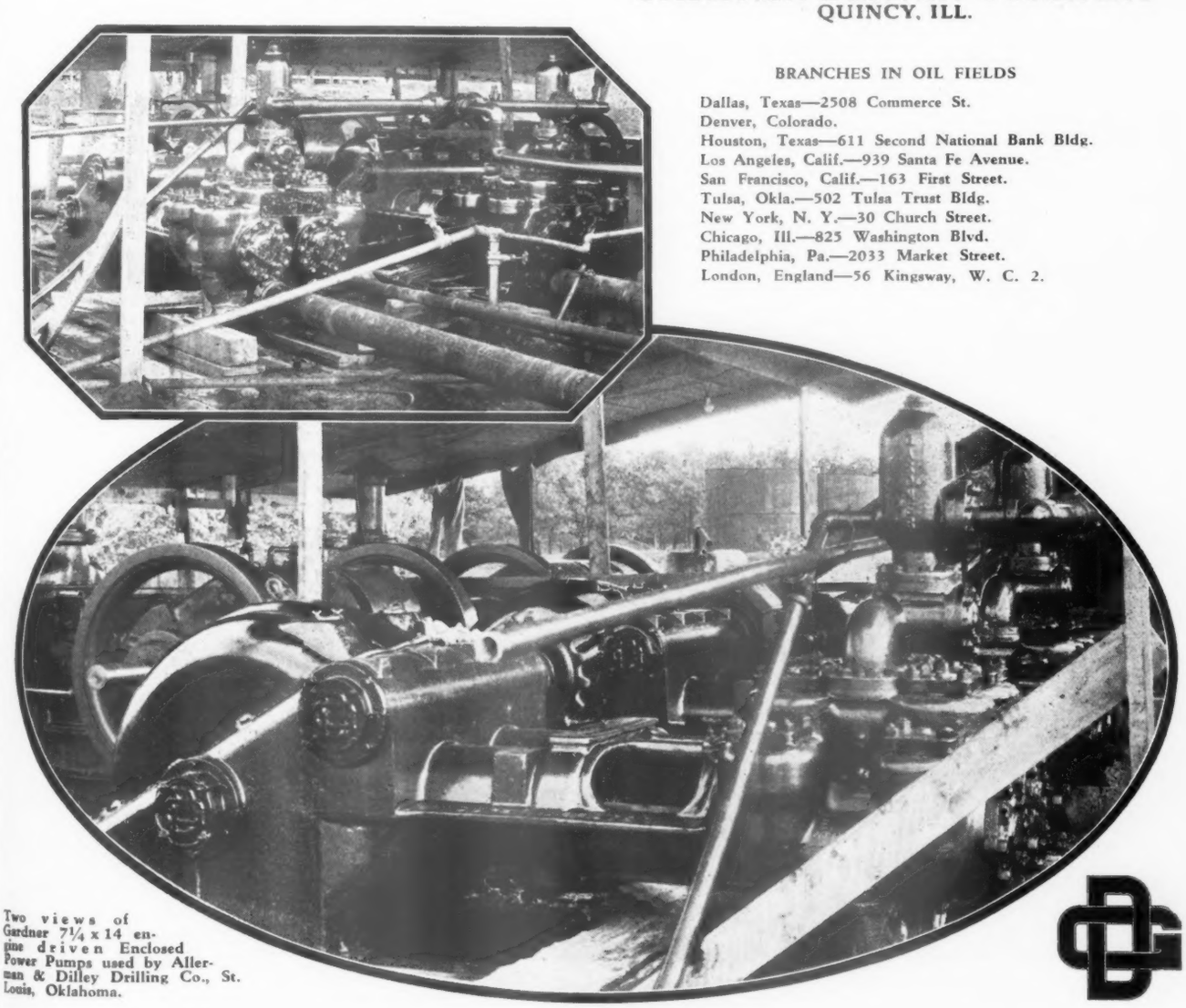
Tulsa, Okla.—502 Tulsa Trust Bldg.
New York, N. Y.—30 Church Street.
Chicago, Ill.—825 Washington Blvd.
Philadelphia, Pa.—2033 Market Street.
London, England—56 Kingsway, W. C. 2.



Two views of Gardner 7¼ x 14 engine driven Enclosed Power Pumps used by Allerman & Dilley Drilling Co., St. Louis, Oklahoma.

GARDNER-DENVER

Say you saw it in The OIL WEEKLY

WILDCATS FROM ALL SECTIONS

WEST TEXAS

Completions

CROCKETT COUNTY—		
Hal Compton & Co., University 1..	*	2225
HOWARD COUNTY—		
Mays-Nixon et al, Flowers 1	*	2517
IRION COUNTY—		
Central Oil Co., Horney 1	*	1355
JONES COUNTY—		
Cowboy Evans et al, King 1	*	2103
RUNNELS COUNTY—		
Agnew & Son et al, Russell 1	*	4025
TAYLOR COUNTY—		
Grisham-Hunter Corp., Stevens 1....	*	2753
WINKLER COUNTY—		
Cranfill & Reynolds, Hendrick 1-F..	*	2900

ANDREWS COUNTY—Deep Rock Oil Co.'s Hostetter 1, dr 1005 ft. Mid-Continent Pet. Corp.'s M. M. Fisher 1, lcn.

BORDEN COUNTY — Condor Pet. Co.'s Hall 1, elev 2601 ft, top salt 1235 ft, dr 2985 ft. E. L. Doheny et al's Koonsman 1, elev 2427 ft, top salt 900 ft, top lime 2430 ft, sd 3680 ft.

BREWSTER COUNTY—Ed. W. Bateman & Co.'s Neville Ranch 1, dr 610 ft. Brewster Oil Co.'s Fee 1, machine. Cowden & Cole et al's Jackson 1-A, dr 1730 ft. Forest Oil Corp.'s Skinner 1, sd 1150 ft. Van McPhail et al's McIntyre 1, sd 1765 ft. Clayton Williams et al's Poncey 1, dr 905 ft.

COKE COUNTY — Cates & Dennis' J. R. Mims 1, sd 1465 ft. Lipan Oil Co.'s Rawlings 1, sd 2840 ft. Louisiana Oil Ref. Corp.'s Powers 1, elev 2040 ft, ur 3060 ft. Mid-Kansas O. & G. Co.'s Lackey 1, sd 1960 ft.

CONCHO COUNTY—K. Kimberlin et al's Maloy 1, sd 1460 ft.

CRANE COUNTY—Gulf Prod. Co.'s Waddell 5, fsh tools after shot, td 3483 ft; Waddell 6, rig.

CROCKETT COUNTY—Barbara Oil Co.'s H. B. Cox 1, elev 2051 ft, top lime 1082 ft, sd hfw 1274 ft. V. T. Bolin & Co.'s Coates 1, co 2110 ft. T. W. Callahan et al's Todd 1, elev 2465 ft, top salt 905 ft, sd 2208 ft. W. W. Donnelly et al's Shannon 1, (Sec. 9), elev 2486 ft, sd showing oil and gas, td 1719 ft. Donnelly-W. A. Moncrief & J. D. Young's Toss 1, (Sec. 35), spudded and sd. Texas-Canadian Oil Co.'s University 1, dr 1555 ft. J. D. Wheeler et al's State Fee 1, sd 285 ft. F. P. Zoch et al's Tippett 1, dr 95 ft.

CULBERSON COUNTY — Deep Rock Oil Co. et al's Seay 2, sd 520 ft. J. M. Hickey et al's Finley 1, sd 1660 ft. Scott & Dittman's Miller 1, sd 1765 ft. West Texas Oil & Explo. Co.'s McGregor 1, sd 385 ft.

JEFF DAVIS COUNTY—Sam F. Means et al's J. Z. Means 1, sd 3271 ft.

DAWSON COUNTY — Magnolia Pet. Co.'s W. R. Jeter 1, elev 2889 ft, top salt 1640 ft, ur cas 2800 ft.

EDWARDS COUNTY—Gale Oil Co.'s Jernigan 1, sd 2700 ft. McMan O. & G. Co.'s Schreiner 1, sd 3640 ft.

EL PASO COUNTY—C. E. Sillix et al's Malone 1, sd 1010 ft.

FISHER COUNTY — Hal Cochran et al's McWhirter 1, sd 1837 ft. Cranfill & Reynolds' Sharp 1, dr 2505 ft. J. B. Dunigan et al's Henry 1, dr 415 ft. Hucony Gas Co.'s Marberry 1, elev 1876 ft, sd 2840 ft. R. W. Rainey et al's Marberry 2, elev 1929 ft, top lime 2995 ft, sd hfw 3507 ft. Roeser-Pendleton-Landreth's Decker 1-B, dr 3355 ft. Thompson et al's Newman 1, rig.

GAINES COUNTY—Pure Oil Co.'s Williamson 1, spudded and sd.

GARZA COUNTY—Emerald Oil Co.'s Boren 3, pb for second shot, td 4801 ft.

GLASSCOCK COUNTY — Merriwether Oil Co.'s McDowell 2, dr 480 ft. World Oil Co.'s L. S. McDowell 1-C, dk.

HOWARD COUNTY—Worth B. Andrews et al's Neal 1, elev 2731 ft, top salt 2015 ft, sd 3278 ft. Greene O. & R. Co.'s Furrh 1, elev 2277 ft, top salt 1255 ft, top lime 1975 ft, dr lime 2185 ft; C. C. Slaughter 1, dk. L. C. Harrison et al's Dodge 1, elev 2321 ft, top salt 1830 ft, dr 3225 ft. Group One Oil Corp. (Texon's) Quinn 1, elev 2499 ft, top salt 1070 ft, dr 3055 ft. Group One & Marland Prod. Co.'s Eason 1, dr 1405 ft; Settles 4, dr 1505 ft; Settles 6-A, dr 1795 ft. Henshaw (now American Maracaibo Co.'s) Settles 2-A, dr 1690 ft; Settles 1-B, elev 2680 ft, top lime 2085 ft, testing 2000 ft, oil in hole at 2933-38 ft; Settles 1-C, dr 2025 ft; Settles 2-C, dr 1970 ft; Settles 3-C, rig. Howard County Oil Corp.'s Kloh 1, spudded and sd. Louisiana O. R. Corp.'s Kloh 1, pb from 3217 to 2490 ft for shot; Settles 2, dr 1300 ft. Phillips Pet. Co.'s Thomas 1, elev 2591 ft, top salt 1170 ft, dr 2005 ft. Plymouth Oil Co.'s Kloh 1, spudded and sd. Taylor-Link Oil Co.'s Kloh 2, lcn. Witherspoon et al's Kloh 1, spudded and sd.

HUDSPETH COUNTY — The California Co.'s University 1, bad hole 171 ft. Western States Oil Co.'s Gardner-Mosely 1, sd 3125 ft; S. W. Moore 1, fsh 2750 ft.

IRION COUNTY—Furhman Pet. Corp.'s J. D. Sugg 1, 2 and 3, lcns. Kimbrough et al's Nutt 1, sd 1400 ft. Kingwood Oil Co. et al's J. D. Sugg 1, elev 2334 ft, swab 25 bbls daily, td 3435 ft. Mertzon Oil Co.'s Roach 1, sd 2202 ft. Signal Oil Co.'s Sugg 1, elev 2415 ft, top salt 705 ft, ur cas 2438 ft. Sun Oil Co.'s Williams 1, elev 2332 ft, sd 3675 ft. Webb et al's Nutt 1, sd 2035 ft.

JONES COUNTY — Annabelle Oil Co.'s Bickley 1, rig. Atkinson & Sandefer's Hudspeth 1, ur cas 2390 ft. W. G. Clark et al's Thomas 1, dr 1830 ft. Cosden & Herbert Oil Co.'s Bickley 6, spudding. Cranfill-Reynolds & Dilworth's Bickley 1, dr 2380 ft. Hucony Gas Co.'s Thomas 1, lcn. Independent O. & G. Co.'s Smith 2 and 3, rigs. McNeeley et al's Bland 1, rig. Mid-Sun Oil Corp.'s Hoehn 1, dr 475 ft. Phillips Pet. Co.'s Mason 5, rig; Pomroy 2, rig; Joe Winters 1-W, rig. Milt Richardson et al's Martin 1, co 900 ft. Robert Oil Corp. et al's Grayson 6, dr 795 ft. Roeser-Pendleton & Landreth's Grayson 3, dr 830 ft. Sinclair O. & G. Co.'s Bickley 2, sd 2475 ft. Snowden & McSweeney's Bickley 4, spudding. Texas & Cosden & Co.'s Camp 1, elev 1883 ft, co and swabbed 57 bbls. oil 2516-19 ft, td 2531 ft; L. Carter 3, dr 830 ft; Carter 4, spudding; Carter 5, rig. Woods & Williams' Parr 1, dr 1810 ft.

KENT COUNTY—Cosden & Co.'s Bilby 1, elev 2060 ft, sd 3560 ft.

KING COUNTY—The Texas Co.'s Johnson 1, dr 4305 ft.

LOVING COUNTY—Lockhart & Co.'s R. L. Allen 2, top salt 722 ft, dr 3370 ft.

LYNN COUNTY—Geo. B. McCamey et al's C. O. Edwards 1, lcn.

MENARD COUNTY — J. C. Barnett & Drake's Callahan-Rasmussen 1, sd 2065 ft. Panhandle Ref. Co.'s G. P. Eckhardt 1, dr hfw 3230 ft.

MIDLAND COUNTY—O. H. Shoup et al's Parks 1, elev 2871 ft, top salt 1740 ft, dr 4225 ft.

MITCHELL COUNTY—E. P. Campbell et al's Pond 1, re-set cas 730 ft. Hucony Gas Co.'s Weichsel 1, elev 2139 ft, top salt 550 ft, top lime 1342 ft, dr 2855 ft. Teas & Wheeler's Radford 1, elev 2223 ft, top lime 1365 ft, dr 2690 ft.

NOLAN COUNTY—Herbert Oil Co.'s Pepper 1, elev 2242 ft, sd 3303 ft. White Eagle O. & R. Co.'s Allyn 1, ur cas 870 ft.

PECOS COUNTY—Alexander-Lyles et al's Sellman 1, elev 2672 ft, top salt 814 ft, top lime 1602 ft, sd hfw 1655 ft. Atlantic Oil Prod. Co.'s Sellman 1, sr 800 ft. Benedum-Trees et al's Corder 1-A, top lime 1840 ft, dr 2315 ft. M. Z. Dibble et al's Bonebrake 1, elev 2555 ft, top salt 1874 ft, sd 2004 ft. Ditto Oil Interests' Montgomery 1, sd 660 ft. J. W. Grant et al's Turney 1, elev 2592 ft, sd 3850 ft. McCarty Oil Co.'s Bennett 1, sd 935 ft. Mauch & Krogen's Holmes 1, elev 2325 ft, top salt 535 ft, sd 1138 ft. Pecos Valley Oil Co.'s Fee 1, elev 2501 ft, top salt 1115 ft, flow 75 bbls oil daily 1626-28 ft. Rio Pecos Oil Co.'s Yates 1, top lime 1099 ft, cem cas 1101 ft. Schumaker et al's Williams 1, spudded and sd. Southern Crude Oil Pur. Co.'s Scharbauer 1, elev 2680 ft, dr 3200 ft. Talbot & Dittman's Unsicker 1, spudded and sd. Transcontinental Oil Co.'s University 1, elev 2552 ft, top lime 1035 ft, fsh 4128 ft. World Oil Co.'s Kloh 1, elev 2810 ft, sd 3105 ft. Yates Ranch Oil Co.'s Yates 1, dr 200 ft.

PRESIDIO COUNTY—Eastland Oil Co. et al's Tootle 1, spudded and sd. L. C. Brite

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Some very interesting problems occur in production in the Gulf Coast oil fields, where the production engineers have a great many peculiar and difficult locations to contend with.

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Prod. Co.'s Brite 1, sd 2785 ft. Empire-Delmar & Philips Pet. Co.'s Tootle 1, fsh 680 ft.

REAGAN COUNTY—Empire Gas & Fuel Co.'s Sawyer 1-A, elev 2474 ft, top salt 910 ft, dr 2835 ft. Skelly Oil Co. et al's University 3, elev 2895 ft, top salt 1320 ft, dr 2885 ft. Texon Oil & Land Co.'s University 1-B, (World's deepest test) flow 44.7 deg. oil by heads, dr 8520 ft.

REEVES COUNTY—E. W. Brooks-Thompson et al's Eddins 1, elev 2719 ft, top salt 1622 ft, top gray lime 3216 ft, fsh 5658 ft. D. P. Davis et al's Kinney 1, spudded and sd. The Exploration Co.'s Kinney 1, elev 2847 ft, sd 2900 ft. Dr. Kitsos et al's Kloh 1, elev 4786 ft, sd 800 ft. R. R. Penn et al's E. G. Bowles 1, lcn.

RUNNELS COUNTY—Boyce et al's Lange 1, rig. Foster et al's Currie 1, lcn. Nourse & Tilton's Cramer 1, dr 560 ft. Union Oil Co. of Nevada's Allen 1, sd 1365 ft. Vacuum Oil Co. et al's Brevard 1, rig.

SCHLEICHER COUNTY—Ft. McKavitt Oil Co.'s Tisdale 1, sd 260 ft.

SCURRY COUNTY—Landreth Prod. Corp.'s Hillmer 1, elev 2314 ft, top salt 870 ft, dr 3650 ft. J. B. Mims et al's Koonsman 1, spudded and sd. R. B. Pender O. & G. Co.'s Davis 1, elev 2208 ft, top salt 445 ft, ur 910 ft.

STERLING COUNTY—Foster & Gracey Oil Co.'s Foster 1, elev 2260 ft, sd 1600 ft.

STONEWALL COUNTY—Sun Oil Co. et al's Rayner 1, elev 1818 ft, top lime 1500 ft, dr 3325 ft.

SUTTON COUNTY — Phillips Pet. Co.'s Cusenbary 1-A, skid rig; Holman 1, fsh 5775 ft.

TAYLOR COUNTY—Burnham et al's Amyx 1, dr 950 ft. Hurley Oil Co.'s Payne 1, top lime 2473 ft, sd hfw 2600 ft. Mid-Kansas O. & G. Co.'s Parramore 1, dr 1835 ft. Mid-Continent O. & G. Co.'s J. H. Taylor 1, lcn.

TERRELL COUNTY—Big Bend Oil Corp.'s Bassett 1, spudded and sd. Mrs. J. B. McPhee et al's Sam Belt 1, spudded and sd. Milham Corp.'s Bassett 1, elev 2270 ft, dr 4385 ft. Keck-Pecos Oil Trust's Hamilton 1, sd 1749 ft.

TERRY COUNTY — Superior Oil & Gas Corp.'s Brownfield 1, elev 3205 ft, dr 4570 ft.

UPTON COUNTY—Keck Investment Co.'s McClintic 1, elev 2652 ft, top salt 1100 ft, top lime 2725 ft, swab 120 bbls oil 12 hours after shot, td 2934 ft.

VAL VERDE COUNTY—Dyer Bros. et al's W. E. Wilson 1, sd 1380 ft. Producers Oil Co. et al's Everett 1, sd 380 ft. Val Vert Oil Corp.'s Bassett 1-A, sd 1250 ft.

WARD COUNTY—E. B. Lovelace et al's Redman 1, spudded and sd. Prairie O. & G. Co.'s Sealy 1, elev 2666 ft, top salt 1073 ft, top lime 3110 ft, sd hfw 3124-65 ft. Rector Oil Co.'s Johnson 1, elev 2438 ft, top salt 745 ft, top lime 2010 ft, dr lime 2220 ft. J. F. Shipley et al's Hayzlett 1, elev 2503 ft, top salt 727 ft, flowing 100 bbls 34 drg. oil daily 2480-81 ft. Talbot et al's C. C. Dorr 1, sd 670 ft.

WINKLER COUNTY—Amerada Pet. Corp.'s Daugherty 2, top lime 2654 ft, cem cas 2656 ft; Daugherty 3, dr 500 ft. Atlantic-Kessler & Logan's Daugherty 2, elev 2894 ft, top lime 2622 ft, making 50 milion ft gas 3120 ft. Barnsdall Oil Co.'s Morton 1, elev 2730 ft, top lime 2870 ft, show oil 2884 ft; Morton 2, sd 1095 ft; Morton 3, dk. Empire G. & F. Co.'s Daugherty 2, top lime 2690 ft, cem cas 2694 ft; Daugherty 3, dr 1180 ft; Daugherty 1-B, dr 950 ft. Kermit Dev. Co.'s Carter 1, sd 400 ft. Gulf Prod. Co.'s O'Brien 2, sidetracking drill stem, td 1841 ft; O'Brien 3, dr 1920 ft. Magnolia Pet. Co.'s Scarborough 1, top salt 1122 ft, top lime 2700 ft, re-bldg dk, td 2840 ft. Marland Prod. Co.'s Morton 1, dr 890 ft; Morton 2, dk. Prairie O. & G. Co.'s Daugherty 1 and 2, rigs; Morton 1, rig. Shell Pet. Corp. & Danciger O. & R. Co.'s Daugherty 1, sd 665 ft; Daugherty 2, dr 850 ft. Simms Oil Co. et al's Sealy 1, spudding. Wentz Oil Corp.'s Morton 1, dr 1190 ft.

SOUTHWEST TEXAS

Completion

NUECES COUNTY—
Alexander & Smith, Elleff 1, Aqua Dulce ..... * 2080

BASTROP COUNTY—Cranfill & Reynold's Yost 2, Cedar Creek, dr 650 ft; Yost 3, Cedar Creek, ru. Amerada Pet. Corp.'s Yost 1, Cedar Creek, testing serpentine at 1522 ft. Atlantic Oil Producing Co.'s Yost 1, Cedar Creek, spudded. The Texas Co.'s Yost 1, Cedar Creek, lcn. Gypsy Oil Co.'s Lottman 1, e Bastrop, sd 2145 ft.

DUVAL COUNTY—Sun Oil Co.'s Norton 1, dr 1850 ft. R. Driscoll's Fee 13, dr 410 ft, shale.

HIDALGO COUNTY—Queen City O. & G. Co.'s American Land & Irrigation Co. 2, 3 mi n Mercedes, sd 700 ft.

JIM HOGG COUNTY—T. J. Conway's Palacios 1, dr 2010 ft shale.

JIM WELLS COUNTY—Cushing Oil Co.'s Perez 2, 3 mi n Alice, stdg 2700 ft.

KINNEY COUNTY—Stephens et al's Clamp 1, sd 180 ft.

MAVERICK COUNTY—Rycade's Sullivan 3, dr. 4500 ft; Chittam 2, fsh 7635 ft; Chittam 3, ru. Ryan Consolidated Pet. Co.'s Indio Co. 2, td 1175 ft.

NUECES COUNTY—Alexander & Smith's Elleff 1, Aqua Dulce, abn at 2080 ft as dry hole. Maddox-Horn-Davis' Ragland 1, Aqua Dulce, sd 400 ft. Sigmond et al's Allan 1, dr 2850 ft. Rosenblum & Grimm's Alban 1, Aqua Dulce, td 2830 ft.

SAN PATRICIO COUNTY—LaPrelle et al's White Point 1, dr 3130 ft shale. Pickett et al's Whitworth 1, White Point, sd 3250 ft. Leach et al's Collins 1, Mathis, dr 2422 ft shale.

STARR COUNTY—The Texas Co.'s Resendez 1, dr 2576 ft shale and fossils.

WEBB COUNTY—Baku Oil Co.'s Bruni 1, dr 2335 ft shale. W. R. Jewell's Bruni 1, sd 80 ft. J. J. O'Brien's Benavides 1, tested gas at 2328-40 ft.

TEXAS GULF COAST

Completions

AUSTIN COUNTY—
Gulf, Jackson 1, San Felipe ..... * 3350

JEFFERSON COUNTY—
Gaddy Oil Co., Johns 1, 1 mi nw Beaumont ..... * 2612

FORT BEND COUNTY—
Gulf, Wolf 12, Long Point ..... * 765
Sun Oil Co., E. C. Farmer 5, Boling * 3675

AUSTIN COUNTY—Humble's Hardy 1, Raccoon Bend, dr 1018 ft sand; A. Grawunder C-1, Raccoon Bend, waiting on cem to set around cas at 1336 ft; Beal 1, Raccon Bend, dr 2864 ft hard shale and lime; Bracey B-1,

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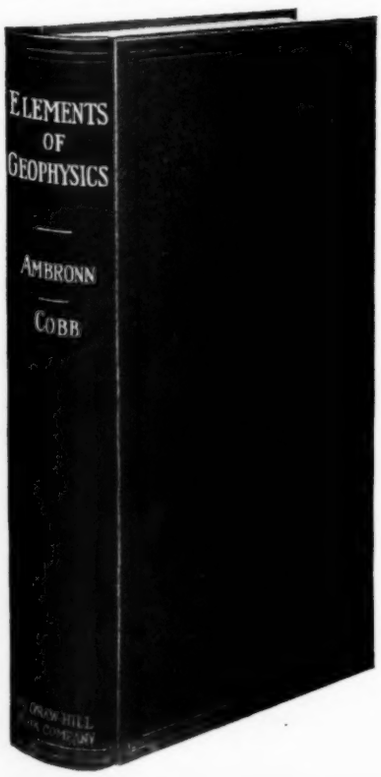

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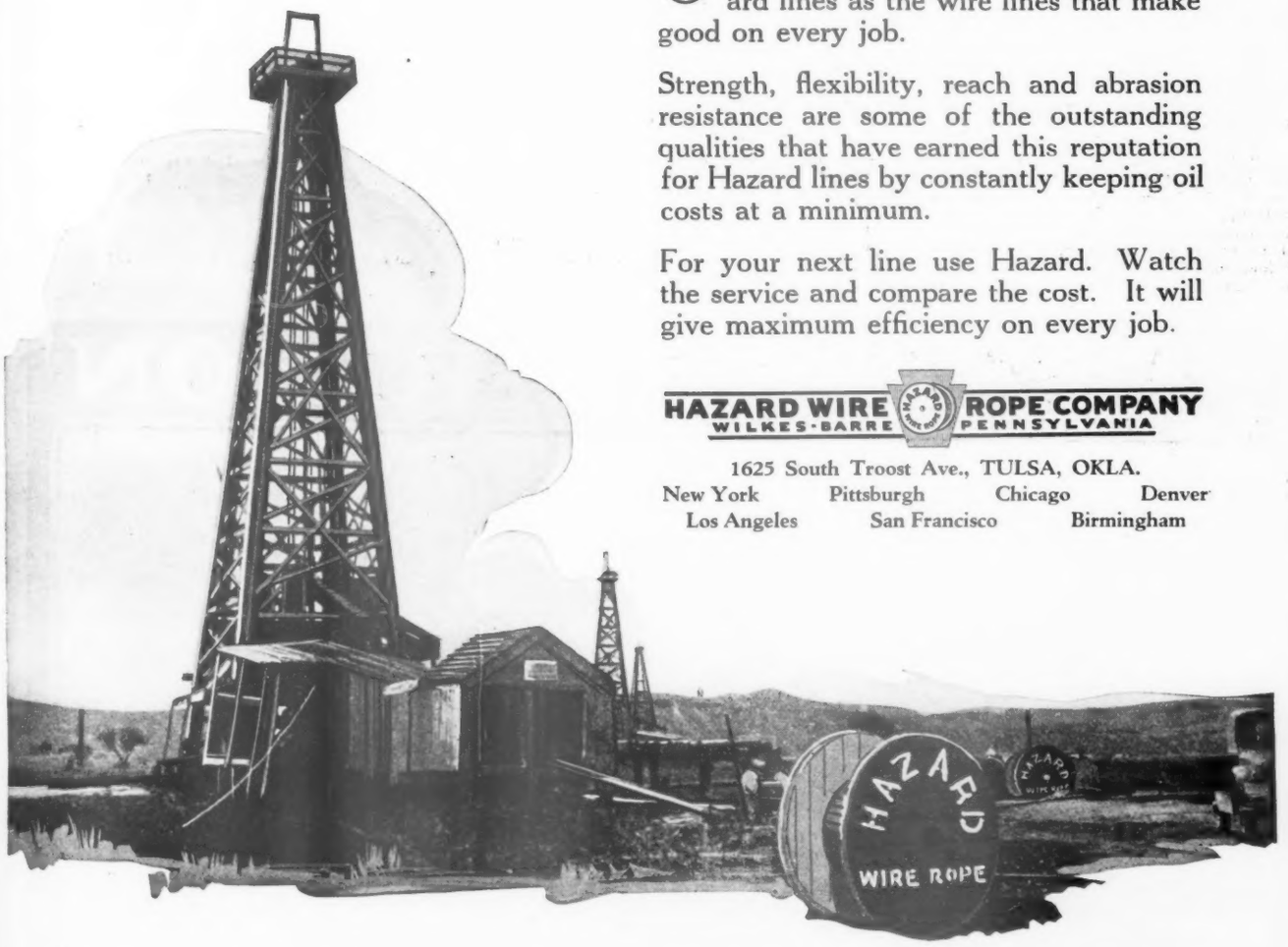

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BRAZORIA COUNTY—Shell Pet. Corp.'s Allen 5, Allen dome, dr 3850 ft lime; Reese 3, Allen Dome, dr 2225 ft. Myers et al's Davidson 1, Clemens Dome, dr 790 ft water sand. F. A. Bartlett's Dannenbaum 8, Stratton Ridge, sd 3145 ft. Empire O. & G. Co.'s Brock 1, Stratton Ridge, temp abn at 2060 ft.

CALHOUN COUNTY—Baker & Thompson's Thomas 1, 10 mi W. Pt. Lavaca, dr 2050 ft gbo.

CHAMBERS COUNTY—Pure Oil Co.'s Lost River 2, Lost Lake, dr 3450 ft sand; Lost Lake 2, ru. Gulf's Wilburn 1, Hankamer, lcn. Mills Bennett's Kirby 2, Barbers Hill, dr 3550 ft gbo; Smith 2, Barbers Hill, drk. Humphreys Corp.'s Kirby C-1, Barbers Hill, dr 3845 ft shale; Kirby B-6, Barbers Hill, set surface cas at 510 ft.

COLORADO COUNTY—Rich Oil Corp.'s Brun 1, 3 mi ne Columbus sd 1215 ft. The Texas Co.'s Hoyo 1, Eagle Lake, dr 7175 ft shale.

FAYETTE COUNTY—Phalen et al's Cervanca 1, 6 mi s La Grange, dr 2650 ft gbo. Moore et al's Kerr 1, Muldoon, sd 2025 ft.

FORT BEND COUNTY—Sun Oil Co.'s E. C. Farmer 4, Boling, ru; E. C. Farmer 5, Boling, abn at 3675 ft salt; Kasparek 4, Boling, dr 1880 ft gbo. Gulf's Wolf 12, Long Point, abn 765 ft; Wolf 13, Long Point, dr 600 ft; Moore 17, Moore's Field, abn at 4195 ft; E. C. Farmer 2, Boling, dr 3725 ft shale. Fort Bend Oil Co.'s Moore 1, Orchards, tested salt water at 2880 ft, will deepen. Scott & Peak's Armstrong 1, Boling, sd 1590 ft. Humble's Dew 1, Sugarland, dr 3071 ft sandy shale; Sugarland Industries 4, Sugarland, dr 2177 ft sand and boulders; Deathridge 1, Sugarland, made little production, swabbing and bailing, from 3814 ft, but quit; Deathridge 3, lcn. Nelson 1, Sugarland, fsh 2990 ft; Camp 2, Sugarland, lcn. J. H. Diehl's Armstrong 1, 2 mi e Boling, sd 500 ft. South Texas Exploration Co.'s Hartsfield 1, Needville, dr 3722 ft sand.

GALVESTON COUNTY—Long et al's Irvin & Bishop 1, 2 mi s Dickinson, dr 4025 ft shale and lime. Republic Prod. Co.'s Lobit 1, 1 mi nw Dickinson, dr 2965 ft shale and lime.

GOLIAD COUNTY—J. E. Alexander's Campbell 1, 1 mi n Goliad, sd 825 ft. McCarson et al's Broyles 1, Goliad Townsite, dr 1700 ft shale. Southern Crude's Patterson 1, 10 mi nw Goliad, dr 500 ft.

HARDIN COUNTY—Chappel Hill Oil Co.'s Hale 1, 5 mi nw Sour Lake, dr 1810 ft. Guedry Drlg. Co.'s Guedry 1, 3 mi s Batson, drk.

HARRIS COUNTY—Torsen et al's Stewart 1, 4 mi sw Genoa, sd 691 ft. Hunt et al's Lobit 1, 4 mi n Goose Creek, sd 2145 ft. Humble's Warren 5, Hockley, ru; Minnetex 1, Mykawa, dr 4695 ft shale; Simms-Smith 74, Goose Creek, dr 5491 ft shale. Cedar Bayou Oil Co.'s Johnson 1, 8 mi n Goose Creek, td 4240 ft, washing to bottom. Paxton et al's Brubacker 1, 1 mi ne Clodine, drk. J. A. Shine et al's Kitzman 1, 2 mi n Cypress, dr 2892 ft gbo. Brains et al's Lentze 1, 4 mi s Tom Ball, sd 1120 ft.

JASPER COUNTY—Great Lakes Oil Co.'s Boykin 3, 3 mi ne Rockland, drk. Tar Well Oil Co.'s Mills 1, 3 mi ne Rockland, dr 1765 ft shale and sand. L. A. Painter's Boykin 1, 3 mi ne Rockland, td 1000 ft.

JACKSON COUNTY—The Texas Co.'s Moore 1, Edna, dr 2777 sandy shale. Wright Bros.' Classen 2, Edna, td 3200 ft. Douglas & Lawrence's Lawrence 1, Edna, sd 3020 ft.

JEFFERSON COUNTY—Deep Test Oil Corp.'s McFaddin 1, 1 mi e Spindle Top, sd 2825 ft. Southern Spindle Top O. & Dev. Co.'s Young 1, 1 mi w Nederland, sd 3425 ft. Gaddy Oil Co.'s Johns 1, 1 mi nw Beaumont, abn at 2612 ft gbo. Beaumont Oil Co.'s Tyrrell 1, 2 mi w Brooks, drk. Westbury Synd's West 1, 1 mi ne Westbury, td 1590 ft gbo. Gulf's Burrell et al 2, Fannette, dr 4660 ft gbo. River Oil Co.'s Ship Channel Land Co. 1, 2 mi se Beaumont, td 630 ft. The Texas Co.'s Pipkin & Davis 1, Big Hill, dr 1225 ft sand and shale.

LIBERTY COUNTY—Barlow et al's Hinchcliff 1, 2½ mi ne Cleveland, sd 2215 ft. Kouri et al's Campbell 1, 6 mi s Cleveland, sd 2000 ft. Big Dome Interests' Finley 2, 3 mi nw Hardin, drk; Finley 1, 3 mi nw Hardin, sd 4335 ft. The Texas Co.'s Davis 1, Davis Hill, dr 4345 ft shale and sand. Humble's Sterling 3, Moss Bluff, dr 2818 ft; Welder 9, S. Dayton, waiting cement to set, 3623 ft. Sun Oil Co.'s Koveleika 1, N. Dayton, dr 1990 ft gbo. Union Explo. Co.'s Esperson 1, 5 mi s Dayton, dr 1025 ft shale.

MATAGORDA COUNTY—Rycade Oil Corp.'s Hudson-Humble 4, Markham, ru. Crossland et al's Murphy 1, Shepherds Mott, dr 765 ft gbo. Dr. P. S. Griffith's Culver 1, e Citrus Grove, fsh 3215 ft; Baer 1, 1½ mi n Gulf Hill, sd 1900 ft.

ORANGE COUNTY—Veteran Oil Co.'s Reed 1, 2 mi se Orange fld, dr 2072 ft gbo.

VICTORIA COUNTY—Houston Oil Co.'s McFaddin 2, 11 mi ne Victoria, dr 525 ft shale.

WASHINGTON COUNTY—Sun Oil Co.'s Marcus 1, Clay Creek Dome, dr 2065 ft; Grote 1, dr 1160 ft, being deepened from pay at 1140-54 ft. Einman 1, Clay Creek dome, dr 2089 ft; Schirmer 2, Clay Creek dome, lcn.

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ACADIA PARISH—E. F. Simms' Clement 1, Jennings, sd for orders; Clement 2, Jennings, standing at 3840 ft; Grace Von Schueler 1, Jennings, set cas at 3865 ft; Jennings Oil Co. 1, Jennings, sd 3545 ft; Cockrell 1, Jennings, sd 4330 ft.

ASCENSION PARISH—Gulf's United Lands Co. 11, Sorrento, lcn; United Lands Co. 12, Sorrento, flowing 1300 bbls at 1650 ft. Triumph Oil Corp.'s Lacey et al 2, 1½ mi se Sorrento, set cas at 1100 ft. Burnside Oil Co.'s Roberts 1, td 785 ft. Baton Rouge Pet. Co.'s Liotta 1, sd 1000 ft.

CALCASIEU PARISH—Union Sulphur Co.'s Fee 729, Sulphur dome, drk; Fee 731, Sulphur,

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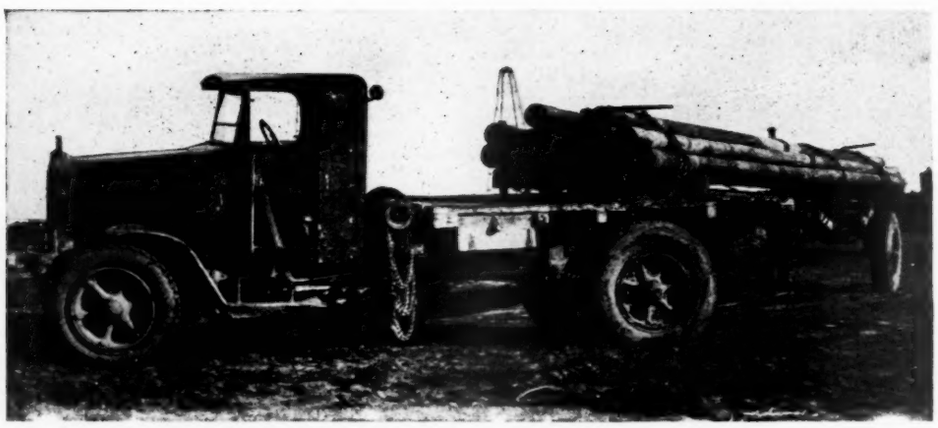

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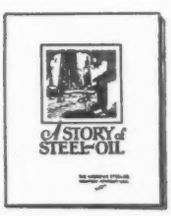

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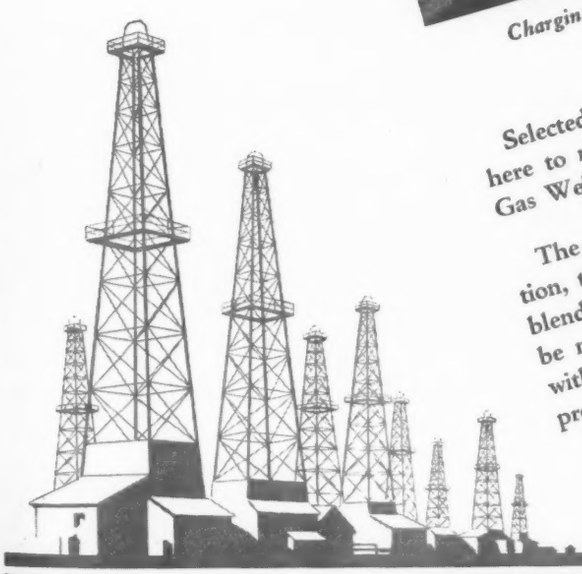

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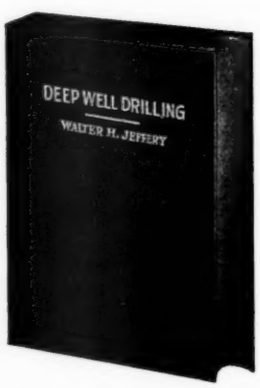

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bailing, td 4796 ft; Fee 733, Sulphur, dr 3845 ft water sand; Fee 734, Sulphur, completed for 2000 bbls 21.5 gravity pipe line oil at 4125 ft; Fee 735, Sulphur, dr 4240 ft; Fee 736, Sulphur, drk; Fee 737, Sulphur, dr 2175 ft sand; Fee 738, Sulphur, ru. Lahay et al's Jones 2, sd 2500 ft. J. W. Watson et al's La. Land Co. 1, Sulphur, sd 4397 ft.

CAMERON PARISH—Pure Oil Co.'s Yount-Lee 6, Sweet Lake, abn at 6262 ft; Yount-Lee 7, Sweet Lake, dr 100 ft; Yount-Lee 8, Sweet Lake, lcn. Calcasieu Oil Co.'s Breaux 1, E. Hackberry, dr 2300 ft; Valery 5, E. Hackberry, spudded. Cameron Oil Co.'s Duhon 2, Hackberry, flowing by heads from 3155 ft making 200 bbls fluid, including wash water and 20 per cent oil, 22 gravity. Rycade Oil Corp.'s Yount-Lee Oil Co. 1, Hackberry, dr 2640 ft rock. Yount-Lee Oil Co.'s School Land 8, Hackberry, dr 3600 ft hard sand. Shell Pet. Corp.'s Watkins 5, Black Bayou dome, set cas at 1235 ft; Watkins 6, Black Bayou dome, lcn.

IBERIA PARISH—La. Land & Exploration Co.'s Avery Island 2, dr 5835 ft brown shale; Vermilion Bay A-3, Cypremont Point, set cas at 960 ft; Bernard 1, New Iberia dome, dr 2332 ft sand and shale. Gulf's State Z-7, Loreauville, ru; Kling 3, Loreauville, drk.

IBERVILLE PARISH — Shell Pet. Corp.'s Wilbert 3, White Castle, drk. Standard of La.'s Wilbert 1, Bayou Blue dome, dr 4300 ft gbo; Schwing 1, Bayou Blue dome, ru. Union Sulphur Co.'s Schwing 3, Bayou des Glaise, set cas at 2700 ft to test oil show at 2700-2730 ft.

LA FOURCHE PARISH—Gulf's Stark et al 8, Thibodaux, ru.

ST. MARTIN PARISH—Rycade Oil Corp.'s State 3, Bayou Bouillon, lcn; Bayou Bouillon 4, set cas at 3330 ft to test sand at 3330-45 ft; Bayou Bouillon 5, dr 3577 ft; Bayou Bouillon 6, drk; Atchafalaya Fee 3, Bayou Bouillon, set cas at 3035 ft; Atchafalaya Fee 4, Bayou Bouillon, dr 3635 ft; Atchafalaya Fee 5, Bayou Bouillon, lcn. Ohio Oil Co.'s Martin et al 3, Hager dome, dr 3925 ft sand. Yount-Lee Oil Co.'s La. Pet. Co. 3, Anse la Butte, tested salt water at 2755 ft, now sd for orders.

ST. MARY PARISH—J. Dannenbaum's Le Blue 1, Charenton, dr 3015 ft shale.

ST. TAMMANY PARISH—Pearl Oil Corp.'s Fritsche 1, Slidell, dr 1768 ft gbo.

TANGIPAHOA PARISH — Kentwood Pet. Co.'s Kent Realty Co. 1, td 1572 ft. Tanli Oil Co.'s Weinberger 2, dr 3185 ft sandy shale.

TERREBONNE PARISH — Southern Gas Co.'s Peoples Sugar Co. 1, Houma, dr 2288 ft rock.

WEST FELICIANA PARISH—Robinson & Long's Raccourci 1, td 300 ft.

MOUNTAIN STATES

COLORADO

ARCHULETA—Juanita Oil Co., Harvey 1, sw 4-32n-3w, standing.

BENT—Marland Oil Co., Pine Springs 1, se 27-29s-49w, sd frozen water line 3978 ft.

JACKSON—Producers & Refiners, State 1, ne 2-6n-81w, sd 1900 ft.

LAS ANIMAS—Alavier Pete Co., Branson 1, ne 3-35s-58w, ready to spud. Parker Club-Kinney Coastal, Fee 1, 4-28s-68w, standing at 1350 ft.

LA PLATA—Childers Dr. & Pr. Co., Dry Mesa 1, 29-32n-14w, refinancing, td 820 ft. Royal P. & R. Co., Red Mesa 1, 27-33n-12w, fuel shortage, sd 650 ft.

LINCOLN—Kelly Oil Co., State 1, ne 36-14s-57w, oil show at 1400 ft.

MESA—Peerless Oil Co., Hoel 1, ne 23-8s-104, ready to deepen from 2058 ft.

MORGAN—Badger Creek O. & G. Co., Kent 1, sw 2-2n-57w, stand 805 ft.

MONTROSE—Uncompahgre O. & G. Co., bw 27-50n-10, dr 1040 ft.

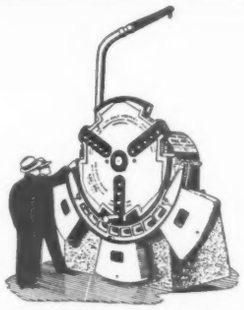
MOFFAT—Ohio Oil Co., State 1, 16-12-100, dr 2850 ft. Alliance Oil Co., Miliken 1, 14-4n-92w, sd indefinitely 3575 ft. McCormick et al, Sales 1, se 28-4n-92w, fsh 2700 ft. McLaughlin et al, Williams 1, 2-3n-91w, spudding 105 ft.

RIO BLANCO—White Eagle O. & R. Co., se 9-2s-96w, fsh tools at 450 ft.

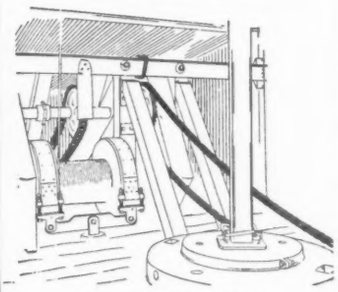
ROUTT—Great Western Oil Co., State 1, 17-60n-56w, stand 2475 ft.

YUMA—Parker Club, sw 7-2s-43, run 15½-inch to 815 ft.

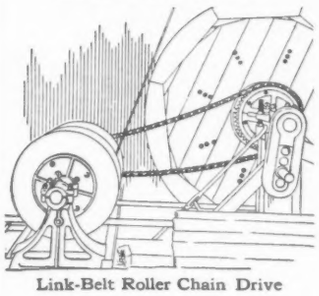
WELD—Platte Valley Pete Corp., Patterson 1, sw 24-6n-61w, dr 4149 ft.



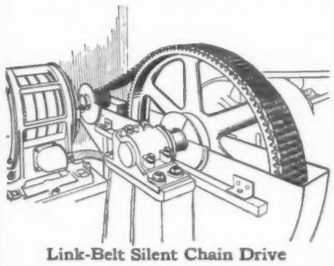
RUF-NEK Pumping Unit



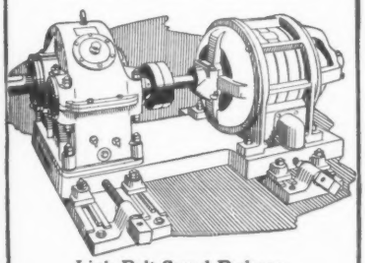
Link-Belt Rotary Chain



Link-Belt Roller Chain Drive



Link-Belt Silent Chain Drive



Link-Belt Speed Reducer

(U. S. and Foreign Patents Pending)

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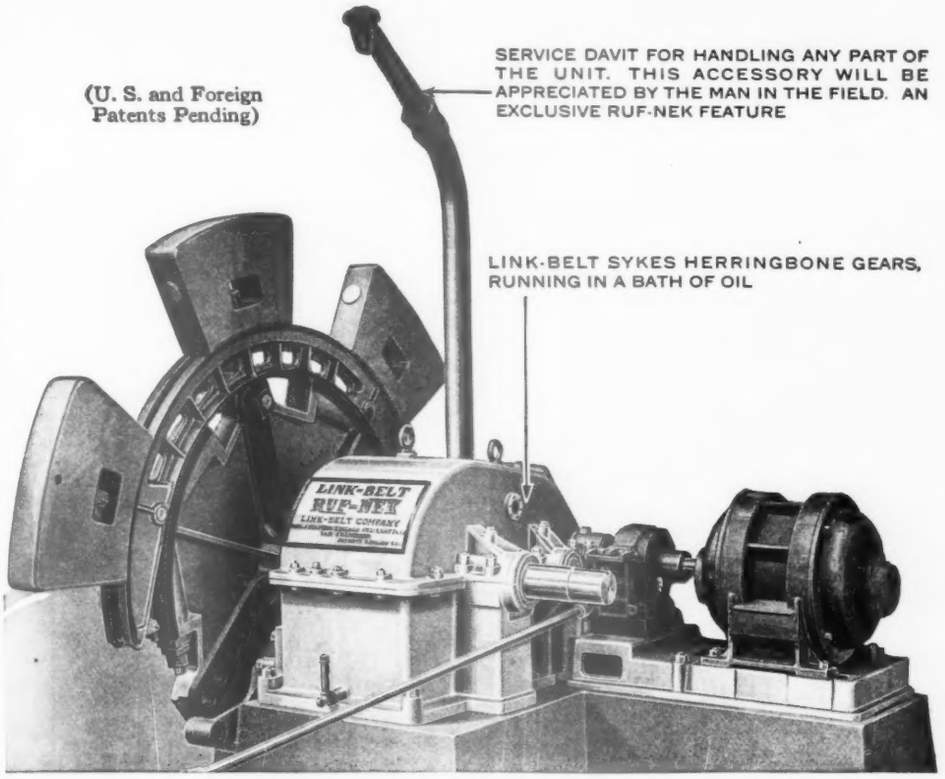
LINK-BELT SYKES HERRINGBONE GEARS, RUNNING IN A BATH OF OIL



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Bulletin 10W

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NEW MEXICO

CHAVES—Snowden & McSweeney, Merchant 1, ne 27-15s-23e, undrr, td 3458 ft. R. E. Neal et al, Russell 1, 21-14-25e, undrr at 1100 ft. Warman et al 1, sw 23-13s-24e, stand 215 ft.

DE BACA—Matador Oil Co., State 1, sw 6-4n-20e, stand 600 ft. McAdoo Pete Corp., McAdoo 1, ne 16-1s-27e, ready to resume, td 4190 ft. Transcontinental Oil Co., McWhorter 1, 6-3S-22e, dr 515 ft.

GUADALUPE—Navajo Oil Co., Goard 1, 10-3n-17e, fsh 2824 ft.

LEA—Midwest Ref. Co., Farnsworth 19, 12-26-37w, dr 3825 ft. Marland, Eaves 1, 19-26-37, fsh tools, td 2969 ft. Marland, Sholes 1, 19-25s-37e, fsh 3034 ft. Marland, Lynn 1, 26-23-36, 6⅝-inch at 3224 ft; Marland, King 1, ne 26-25s-32e, stand 4325 ft; Marland Brooks 1, sw 8-20s-33e, sd 3475 ft; Marland, Danciger 1, 7-23-36e, dr 4005 ft; Marland, Reed 1, 22-20s-36e, dr 1020 ft; Marland, Meyers 1, 26-20s-37e, dr 1400 ft. Marland, Warren 1, 29-20s-36e, 12½-inch set at 800 ft; Marland, Lockhard 1, 31-21s-36e, dr 1500 ft; Marland Slattery 1, 7-22s-34e, dr 3290 ft. Gypsy Oil Co., State 1, 34-21s-36e, dr 3671 ft. Exploration Co., Record 1, 26-19s-35e, td 4556 ft. Morton et al. State 1, ne 32-11s-38, sd 100 ft. Texas Prod. Co., Sheppard 1, ne 6-26s-37e, dr 2967 ft. Texas, Cagle 1, se 9-26s-36e, 10M gas, dr ahead 3100 ft; Texas, Humphreys 1, nw 18-20s32e, lcn; Texas, Moberly 1, se 17-26s-37e, wtg parts. Curtis Dr. Co., Nixon 1, 22-18s-34e, wait pipe, td 1150 ft. C. E. Reynolds Dr. Co., Anderson 1, 29-13s-37e, dr 5260 ft. Cranfill & Reynolds, State 1, se 23-26s-36e, dr 3045 ft. Skelly Oil Co., Joiner 1, se 26-25s-36e, sd bldg storage. Hill & Abel, Maechtel 1, sd 5-26s-33e, dr 990 ft. Maljamar Oil & Gas Corp., Pearsall 2, 30-17s-32e, dr 1219 ft. Empire Gas & Fuel Co., State 1A, nw 12-21s-34e, dr 300 ft. Texas Pacific Coal & Oil Co., State 1, sw 22-23s-36e, lcn.

ROOSEVELT—J. T. Keegan et al., Pepper 1, 6-1s-36e, ready to bld rig. Smith & Sloan, Lovern 1, se 4-3s-35e, lcn.

SAN JUAN—Continental Oil Co., Munoz 17, 2-29-19, sdtr tools, td 6338 ft. Dorothy Oil Co., 29-30-9, dr 712 ft. Huerfano Oil Co., Wiltbank 1, 25-29-11, stndg 800 ft. San Juan Pete Co., 1, 9-29-13w, sd 2950 ft. Kirtland Dr. Co., Hunt 1, 10-29-15, td 450 ft. Kutz Canon O. & G. Co., Day 1, 29-28-11, dr 490 ft. Midwest Ref. Co., State 1, se 36-22n-14w, dr 2610 ft. Blackrock Oil Co., sw 11-25n-13w, dr 1500 ft. Iowa Oil Synd., Viles 2, 28-29-11, oil and gas at 691 ft., td 730 ft. Angel Peaks Oil Co., Kutz Canon 1, 11-28n-11w, underreaming to 1420 ft. R. R. Burke et al, Deneen 1, 18-21-13, sd 1006 ft. Hall et al, 1, 31-22n-13w, sd 507 ft.

SAN MIGUEL—E. Adams et al, Deason 1, 14-15n-16e, sd 1235 ft. Benedict et al, Benedict-Wilson 1, ne 25-17n-16e, dr 510 ft.

SOCORRO—Arnold et al, 2, ne 13-6s-1w, td 1350 ft, last report.

TORRANCE—Bluhall O. & G. Co., 20-6n-10e, wtg cas at 1440 ft. Hall et al, Pinos Wells 1, sw 25-3n-13e, stndg 400 ft. Sinnock et al, Kutchin 1, ne 13-7n-7e, ready to spud.

VALENCIA—Acme Oil Co., New Mexico-Arizona Land Co., 1, 26-6-3, td 3595 ft., last report. Rio Puerco Oil Co., New Mexico-Arizona Land Co., 2, nw 13-6n-2w, pipe at 3145 ft.

MONTANA

BIG HORN—Texas-Montana Prod. Co., 2, 21-6s-35e, cem cas 188 ft.

BROADWATER—New Day Oil Co., 1, ne 29-5n-1e, dr 975 ft., hole full of water.

BLAINE—Ohio Oil Co., Winngert 1, 3-34n-32e, dr 2035 ft.

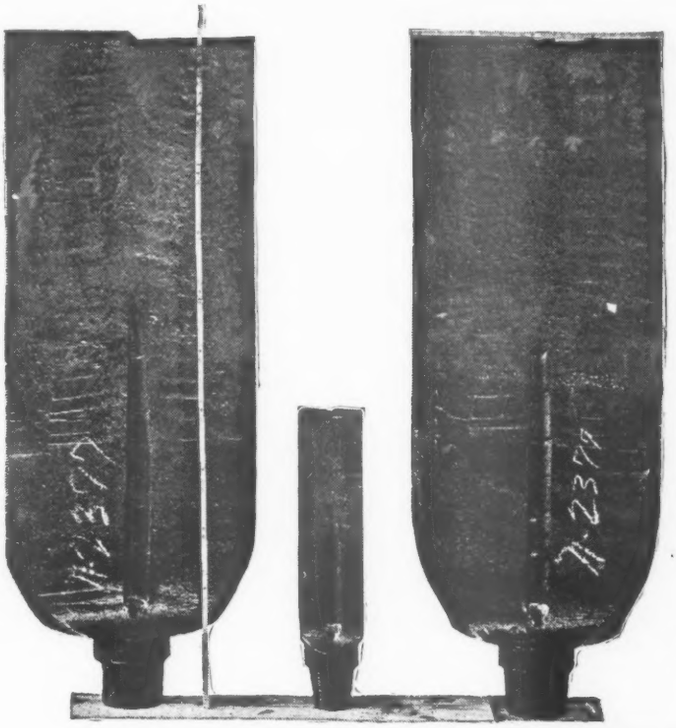
CASCADE—Lone Star Montana Oil Co., sw 13-21-3e, dr 760 ft. Eden Oil & Gas Co., 27-18-4e, dr 660 ft. U. S. Pete Co., Miller 1, 8-21-4e, dr 935 ft. John E. Winther, Power 1, 11-22-1e, dr 1840 ft, oil and gas showing.

CARBON—Ohio Oil Co., Northern Pacific 1, 11-7s-21e, fsh 4458 ft. Local Oil Co., 1, 25-9s-25e, dr 2500 ft.

CHOTEAU—Geraldine O. & G. Co., ne 1-21-11e, undrr 1250 ft. Willison-Shelby O. & G. Co., Flack 1, 12-28-11e, sd 2675 ft.

CUSTER—Montana Belle, ne 28-8n-45e, dr 1035 ft, oil showing.

FERGUS—Melton Corp., 1, se 24-21-17e, td



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Our Bulletin No. 130 tells the complete story of Lucey Fishtail Bits

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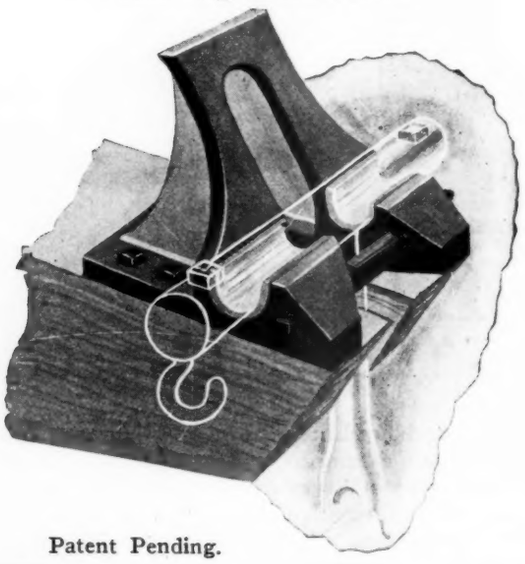

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2665 ft. Judith Basin Oil Co., 1, 33-19n-12e, dr 1850 ft.

GALLATIN—California Co., Ringling 1, 35-5n-7e, dr 410 ft.

JUDITH BASIN—Gem Oil Co., 15-16-10e, rig up.

LIBERTY—Sunburst O. & R. Co.'s Bear's Den 1, nw 17-36-6e, dr 500 ft. Square Deal Pete, Johnson 1, 1-32-7e, dr 3025 ft. Mid-Rocky Dev. Co., Federal Lands 1, 7-33-73, sd 1500 ft. Western Nat. Gas Co., 27-37-4e, dr 1380 ft. Cypress Oil Co., State 1, sw 36-28-6e, dr 350 ft.

MUSSELSHELL—Laffea Oil Co., 1, 6-10n-25e, prep. to move in.

PONDERA—Hiland Oil Co., Van Daele 1, ne 35-30-3w, td 3780 ft. Trapp Synd., 35-28-15e, dr 1850 ft.

STILLWATER—J. S. Stewart 1, 5-2n-22e, td 600 ft, last report.

SWEETGRASS—Shoshone Cons. 1, 23-2n-15e, cas trouble 3720 ft.

TETON—Archer et al, 6-23-2w, abn 1675 ft. Calpet, Eyraud 1, 28-26n-3w, dr 1755 ft. Mitchener et al, Mattoon 1, sw 3-23-1w, dr 800 ft.

TOOLE—Monalta Oil Co., 1, 1-37-4w, spudding. Wm. J. Maham 1, 10-31-1w, dr 1900 ft.

WYOMING

ALBANY—Union of Calif 1, 1-16-76, stand. cem. at 1535 ft.

BIG HORN—Utah Southern Oil Co., 3, 26-56n-97w, prep to test at 3765 ft. Producers & Refiners, 3, 24-56-98, changing to rotary at 2708 ft. Prairie O. & G. Co., Chilcote 1, 35-56n-95w, showing gas at 1300 ft in the base of the Madison. P. & R., South Frannie 1, 7-57-97, run 12½-inch at 1185 ft.

CARBON—P. & R. No. 3, 2-19-88, sdtr 4¾-inch, td 4003 ft. P. & R., O'Brien Springs 2, 7-24-88, dr 483 ft. Graybeal Synd., 16-28-81, prep. to recem. 4000 ft. Producers Oil Corp. and Redfeather Oil Co., se 35-12-92w, lay water line, td 1005 ft.

FREMONT—P. & R. Muskrat 2, nw. 1-33n-92w, lcn. Gates & Holman, 6-33-94, mvg in. Kinney-Coastal 1, 22-3n-1w, rig up.

HOT SPRINGS—Texas Prod. Co., sw 23-45n-100w, dr 150 ft. Westland Oils, Inc., 23-44n-95, rig.

JOHNSON—Matthew Foreman et al, Crazy Woman 1, 7-47-82, bldg rotary rig, td 2100 ft.

LINCOLN—Midwest Ref. Co., Waterfall 1, 35-22-115, sd 1765 ft, dr water well. Midwest Refining Co., Little Grey's River 1, 25-37-113, dr 725 ft.

NATRONA—Weisman et al., 3, 36-36-82, dr 375 ft.

PARK—Calif. Exploration Co. and P. & R., Pitchfork 1, 14-48n-102w, straighten crooked hole at 183 ft. Resolute Oil Co., nw 17-57-101, dr 1775 ft. Cody Pete, Nelson 1, 4-51-102, stand. 1065 ft. Oregon-Wyoming Oil Co., 1, sw 30-52-101, dr 1100 ft. Ohio Oil Co., Pulley 1, 27-53-101, recem. 4¾-inch at 4752 ft and dr in. Lenco Oil Co., Pulley 1, 25-53-101, dr 211 ft. California Explo. Co., 1, 29-48-103, clean out after a shot, 3750 ft., oil in hole.

SWEETWATER — Prairie O. & G. Co., Tucker 1, 18-13-99, dr 2400 ft. Ohio Oil Co., Humphreys 1, 2-12-101, dr 986 ft. Sormir Pete Co., 13-21-100, stand 1335 ft.

SUBLETTE—California Co., Wyss 1, 12-32n-115w, sdtr bit, td 1010 ft. California Co., Buchell 1, 11-29-115, sd 2002 ft, repair boilers.

UINTA—Calif. Co., U. P. 1, 7-17-116w, dr 2021 ft.

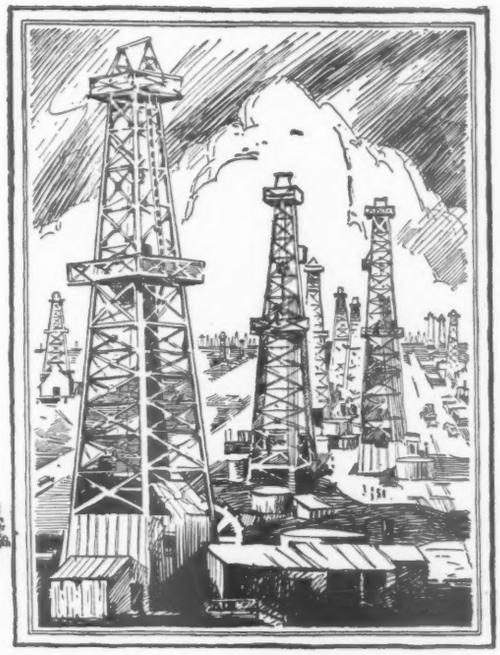
WESTON—Wyoming Drilling Synd., ne 15-44n-64w, dr 4200 ft.

UTAH

DUCHESNE—Utah Southern Oil Co., Pleasant Valley 1, 29-4-1, dr 1480 ft.

GRAND—Utah Southern, Salt Valley 1, 13-23-21, dr 2815 ft. Utah Southern, Shafer 1A, 36-26-20, dr 2435 ft. Navajo Pete Co., 2-29-21, dr 2700 ft, gas showing. Intermountain Venture Co., 1, sw 27-21s-19, sd 1602 ft. Big Six Oil Co. and Utah Oil Refining Co., Randall 1, 10-22-19, fsh 1710 ft. Brendell Sons, Crescent Eagle 2, 9-22-19, resuming. Cisco Union O. & G. Co., 20-21-22, spudded.

SAN JUAN—Boulder Knoll O. & G. Co., 17-34-25, prep to resume 2640 ft. Navajo Pete Co. of California, 1, 12-35-24, will move in standard equipment.



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INQUIRIES INVITED FROM ROYALTY BUYERS.

OKLAHOMA

WOODS COUNTY—T 28n, R 18w, Sec. 31, George Vincent et al's Freedom 1, c sw, pond

GRANT COUNTY—T 28n, R 3w, Sec. 24, Lario O. & G. Co. et al's Connell 1, nwc, rig

HARPER COUNTY—T 27n, R 21w, Sec. 20, A. F. Kopisch Oil Co.'s Selman 1, nec ne, spudded and sd.

WOODS COUNTY—T 27n, R 15w, Sec. 20, Sooner State Oil Co. & E. R. Black's Marcum 1, c sw, spudded and sd.

GRANT COUNTY—T 26n, R 4w, Sec. 34, Sooner State Oil Co.'s Royce 1, swc nw, sd 550 ft.

KAY COUNTY—T 26n, R 2e, Sec. 32, J. A. Vincent and Nat'l Union's McNeal 1, nwc ne, sd 2795 ft.

HARPER COUNTY—T 25n, R 22w, Sec. 14, Hoffer Oil Co.'s Cooper 1, nwc se, sd 4182 ft, litigation.

WOODS COUNTY—T 25n, R 15w, Sec. 10, Bu Vi Bar et al's 1, sec sw, r.o.g.

GRANT COUNTY—T 25n, R 4w, Sec. 22, Cowden's Vollner 1, nec se ne sw, lost tools 5640 ft, sd.

TEXAS COUNTY—T 1n, R 18e, E.C.M., Sec. 11, Three Way Oil Co.'s Price 1, sec nw, hfw 3490 ft, sd.

WOODWARD COUNTY — T 24n, R 17w, Sec. 32, Otstot Dev. Co.'s Simmons 1, sec, sd 1500 ft.

WOODS COUNTY—T 24n, R 13w, Sec. 18, Miller et al's Copenhaver 1, nwc; spudded and sd.

GARFIELD COUNTY—T 24n, R 6w, Sec. 9, Pulse & Beamer's White 1, sec nw, sd 4755 ft.

WOODWARD COUNTY — T 23n, R 20w, Sec. 9, Billy Oil Co.'s Wyatt 1, c se, sd 500 ft. T 21n, R 21w, Sec. 25, Sharon's Elmore 1, swc, sd 3025 ft, rig blown down.

MAJOR COUNTY—T 20n, R 14w, Sec. 25, Keller et al's Horton 1, c ne ne, spudded and sd.

GARFIELD COUNTY—T 20n, R 4w, Sec. 9, Marland Oil Co.'s Looman 1, nec se, sd 5735 ft, casing parted. Sec. 12, Marland Oil Co.'s Miller 1, swc, hfw 4586 ft, sd.

DEWEY COUNTY—T 18n, R 15w, Sec. 9, Huckelby & McCoy's Perfect 1, nec, sd 4395 ft.

LOGAN COUNTY—T 18n, R 3w, Sec. 33, Haley & Consolidated Drlg. Co.'s Quier 1, sec sw, fsh tools 3990 ft. T 18n, R 2w, Sec. 21, Tibbetts & Bond's Donahue 1, swc nw se, show of oil at 5395-5405 ft, dr 5725 ft.

KINGFISHER COUNTY — T 16n, R 6w, Sec. 27, Crawford & McKenna's Sturgeon 1, nec sw, dr 4865 ft.

BLAINE COUNTY—T 15n, R 12w, Sec. 26, W. J. Donley's Dickens 1, sec ne, dr 4226 ft.

CANADIAN COUNTY—T 14n, R 6w, Sec. 9, A. D. Spears' Piatt 1, swc ne, sd 3223 ft.

OKLAHOMA COUNTY—T 13n, R 3w, Sec. 18, Slick and Bailey's Lufkin 1, c ne se, sd 4510 ft. T 12n, R 3w, Sec. 15, Cromwell et al's Thompson 1, swc ne ne, sd 7001 ft. T 11n, R 3w, Sec. 24, I. T. I. O. Co.'s Park 1, c se se, est. 40M gas 4793-4816 ft, td 6402 ft, set 6-inch.

CANADIAN COUNTY—T 10n, R 6w, Sec. 1, J. V. Bailey's Robinson 1, c ne nw, spudded and sd.

OSAGE COUNTY—T 26n, R 6e, Sec. 25, White Eagle O. & R. Co.'s 1, swc ne, dr 810 ft. T 22n, R 8e, Sec. 8, Harry McGill's 1, swc se, ur 10-inch 1210 ft.

PAWNEE COUNTY—T 22n, R 5e, Sec. 33, Washoma O. & G. Co.'s Buffalo 1, sec nw, sd 3340 ft.

LINCOLN COUNTY—T 16n, R 4e, Sec. 15, J. V. Bailey et al's House 1, c ne se, dr 2460 ft. T 16n, R 6e, Sec. 19, Morgan & Flynn's Finley 1, swc, lcn. T 15n, R 6e, Sec. 23, Shaffer O. & R. Co. et al's Pinkston 1, nec sw, dr 2795 ft. T 12n, R 3e, Sec. 29, Phillips Pet. So.'s Roberson 1, sec nw, rig. T 12n, R 6e, Sec. 10, Kingwood Oil Co.'s Jennings 1, swc, cemt 8-inch 4184 ft, R.U.S.T.

CREEK COUNTY—T 14n, R 9e, Sec. 1, Shaffer O. & R. Co., Polk 1, nwc ne se, dr 3442 ft. Sec. 10, Transcontinental Oil Co.'s Taylor 1, nwc sw se, dr 1125 ft. Sec. 26, T. Kelley et al's Anderson 1, swc se, rig.

OKFUSKEE COUNTY—T 12n, R 9e, Sec. 30, Tidal Oil Co. et al's Barnett 1, sec ne ne, dr 640 ft.

MUSKOGEE COUNTY—T 13n, R 18e, Sec.

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APPRAISALS
REPORTS-COMMERCIAL & TAX

SURVEYS
ESTIMATES OF OIL RESERVES

AN EXPERIENCED OIL FIELD ORGANIZATION

33, L. T. Haynie's Linder 1, c se, show gas 2200-49 ft, co 2296 ft.

McINTOSH COUNTY—T 12n, R 18e, Sec. 15, A. B. Wolfe et al's Beck 1, nwc se, spudded and sd.

PITTSBURGH COUNTY — T 9n, R 16e, Sec. 32, Pattison et al's McDuff 1, swc nw se, 3M gas 4613-35 ft, Wilcox 5443-56 ft, co.

HASKELL COUNTY—T 9n, R 18e, Sec. 10, Marion Oil Co.'s Sanders 1, nwc ne sw, rebuilt rig 1800 ft, sd.

PITTSBURGH COUNTY—T 6n, R 14e, Sec. 7, McAylor's Reed 1, nw cor sw nw, set 8-inch 827 ft.

LATIMER COUNTY—T 5n, R 18e, Sec. 15, Limestone O. & G. Co.'s Murray 1, sw cor, dr 2500 ft.

SEMINOLE COUNTY—T 11n, R 6e, Sec. 27, Furhman Pet. Co.'s Fay 1, se nw sw, dr 4620 ft.

OKFUSKEE COUNTY—T 11n, R 7e, Sec. 21, T. B. Slick's Wolfe 1, se ne se, spudding.

SEMINOLE COUNTY—T 11n, R 7e, Sec. 34, Phillips Pet. Co.'s Mill 1, nw sw, fsh 2765 ft. T 10n, R 7e, Sec. 5, Marland Oil Co.'s Strothers 1, nw se ne, dr 1900 ft. Sec. 18, Shaffer O. & R. Co.'s Jones 1, sw cor ne, ts 4705-10 ft, hfw, pb to 3715 ft, sd.

POTTAWATOMIE COUNTY—T 9n, R 4e, Sec. 11, Atlantic & Phillips Bank 1, sw ne ne, dr 4130 ft. T 9n, R 5e, Sec. 30, Magnolia's Germany 1, se cor nw, top Hunton 4159 ft, 1200 ft fluid in hole, dr 4240 ft. T 8n, R 2e, Sec. 24, Superior Oil Corp.'s Jones 1, sw nw ne, td 4957 ft, cemt 5-inch. T 8n, R 3e, Sec. 12, T. B. Slick's Nix 1, se nw nw, rur. T 8n, R 4e, Sec. 15, Phillips Pet. Co.'s Sparkman 1, se cor sw, dr 4131 ft.

SEMINOLE COUNTY—T 8n, R 8e, Sec. 4, McCullough's McGilbray 1, sw cor ne, fsh 1065 ft.

HUGHES COUNTY—T 8n, R 9e, Sec. 18, Pure Oil Co.'s Fixico 1, ne cor sw, dr 4340 ft. T 8n, R 10e, Sec. 1, Bauer's Penn 1, nw sw ne, 4025 ft hfw, dr 4040 ft.

CLEVELAND COUNTY—T 7n, R 1w, Sec. 15, Sooner Oil Co.'s Vandeveer 1, ne nw sw, sd 3120 ft.

POTTAWATOMIE COUNTY—T 7n, R 2e, Sec. 17, T. B. Slick's Spangler 1, nw cor se nw nw, cemtg cave at 5520 ft. T 27n, R 5e, Sec. 14, Champlin Ref. Co.'s Harber 1, sw ne sw cmtg 8-inch 3930 ft.T 6n, R 5e, Sec. 17, Roxana Pet. Corp. et al's Lowe 1, swc nw ne, cemt 8-inch 3995 ft.

McCLAIN COUNTY—T 5n, R 3e, Sec. 29, Empire's Bonner 1, se nw nw, dr 2855 ft.

SEMINOLE COUNTY—T 5n, R 6e, Sec. 11, T. B. Slick's Harjo 1, nwc ne, fsh 6-inch at 3685 ft.

HUGHES COUNTY—T 5n, R 9e, Sec. 17, E. W. Whitney's Huddleston 1, sec sw, show oil 2745-55 ft, sd 3000 ft.

GARVIN COUNTY—T 4n, R 3e, Sec. 10, Garland Oil Co.'s Strickland 1, sw nw sw, dr 3347 ft.

PONTOTOC COUNTY—T 4n, R 4e, Sec. 20, Roxana Pet. Corp.'s Smith 1, nwc sw, dr 2100 ft. T 4n, R 8e, Sec. 23, Independent's Hampton 1, nec se, lcn.

COAL COUNTY—T 2n, R 8e, Sec. 5, Wichtex Oil Co.'s Folsom 1, c nw nw, lcn abn.

MURRAY COUNTY—T 1n, R 2e, Sec. 17, Revels & McGee's Wolfe 1, nwc, ur 10-inch 1500 ft.

COAL COUNTY—T 1n, R 8e, Sec. 35, W. E. McGraw et al's Patton 1, swc se ne, td 4793 ft hfw, pb to 1940 ft shot 30 qts 1850-1885 ft flows 5 bbls 48 grav, cemtg. T 1n, R 9e, Sec. 24, Galbreath et al's Jones 1, swc se, sd 2505 ft.

CUSTER COUNTY—T 14n, R 14w, Sec. 1, W. E. Witt's Wellman 1, c se, spudding.

CADDO COUNTY—T 12n, R 11w, Sec. 15, Abernathy & Ashton's 1, c nw, dr 4540 ft.

ROGER MILLS COUNTY—T 11n, R 26w, Sec. 4, L. C. Hivick's Davis 1, c nw ne, sd 700 ft.

BECKHAM COUNTY—T 8n, R 25w, Sec. 1, E. L. Martin's Daly 1, c nw se, dr 1860 ft. T 8n, R 21w, Sec. 33, Day Oil Co.'s Ault 1, c nw nw, sd 70 ft.

KIOWA COUNTY—T 7n, R 16w, Sec. 26, Connor & Son's Geis 1, sec nw ne, sd 1712 ft. T 7n, R 15w, Sec. 35, Davis Malernee's Van Kirklan 1, nwc, sd 858 ft. T 6n, R 16w, Sec. 18, Alexander et al's Fuqua 1, swc ne, owdd, sand 428-440 ft pumped 225 bbls in 31 hours,

REDUCTIONS

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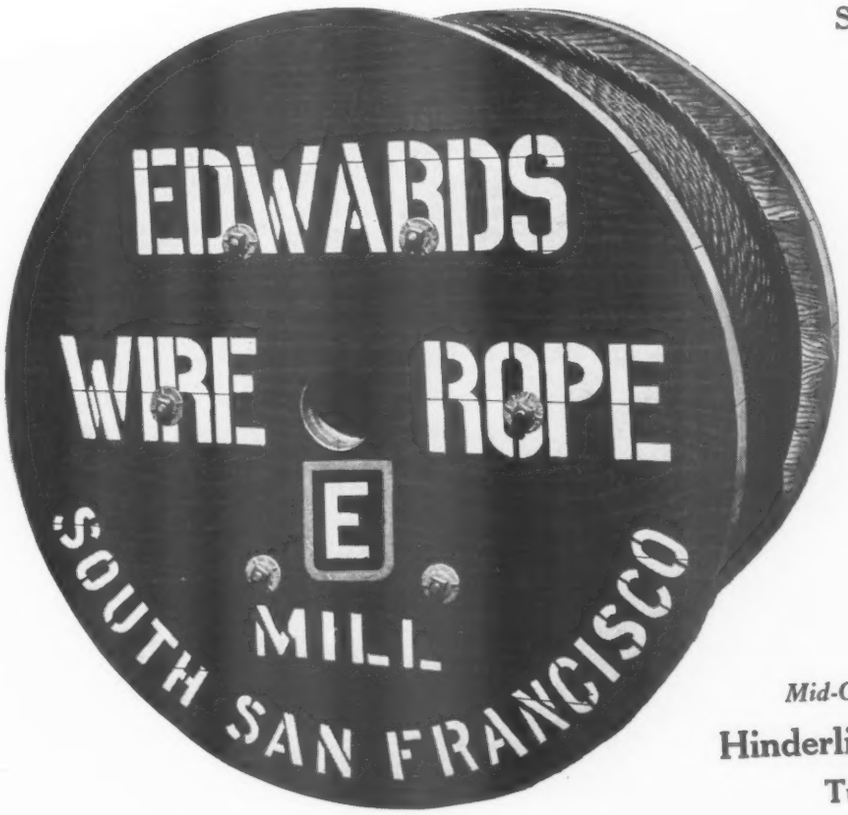

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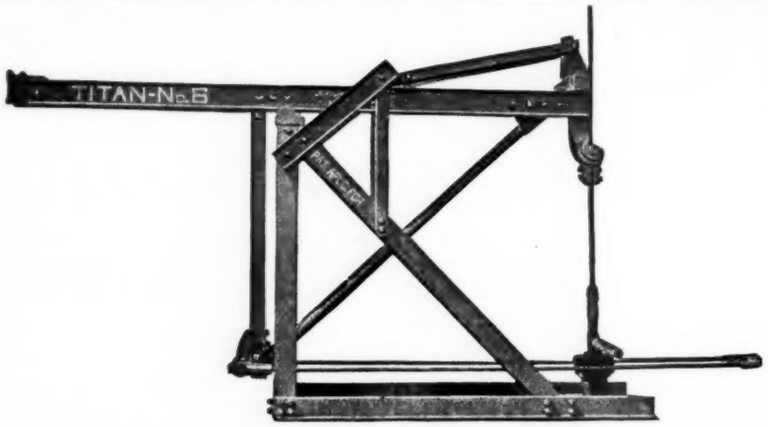

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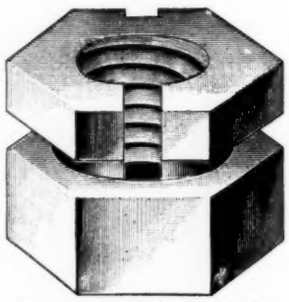

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The World's Largest Manufacturers of Jacks

sd for storage. T 6n, R 15w, Sec. 6, Johnson McDowell's 1, c sw ne, sd 2033 ft. T 6n, R 14w, Sec. 31, Sloan et al's Sloan 1, ne cor, lcn.

CADDO COUNTY—T 6n, R 12w, Sec. 29, W. J. Hartley's Gilbreath 1, se cor nw se, cwdd, sd 3394 ft.

KIOWA COUNTY—T 5n, R 14w, Sec. 6, Russell & Sloan's Rushton 1, ne cor sw se, fsh 730 ft.

GRADY COUNTY—T 5n, R 6w, Sec. 31, Wirt Franklin's Long 1, sw cor ne, lcn abn.

COMANCHE COUNTY—T 4n, R 11w, Sec. 2, Wirt Franklin's Hollow 1, nw cor, sd 1472 ft, show gas 1446-63 ft.

JACKSON COUNTY—T 1n, R 20w, Sec. 4, Houseman et al's Northington 1, ne cor, sd 1000 ft.

KIOWA COUNTY—T 1n, R 17w, Sec. 13, Allen Bros.' Howell 1, nw cor, dr 126 ft in oil sand.

STEPHENS COUNTY—T 1n, R 7w, Sec. 2, Stahl & Burris' Jefferson 1, se cor ne nw, dr 2361 ft.

JACKSON COUNTY—T 1s, R 20w, Sec. 23, Stanley McGregor's 1, sw cor nw sw, dr 2070 ft.

STEPHENS COUNTY—T 1s, R 7w, Sec. 12, Ilsing, Russell & Nance's Houston 1, ne cor sw sw, dr 1218 ft.

KIOWA COUNTY—T 2s, R 16w, Sec. 6, Landfair's 1, se cor sw se, dr 2522 ft.

COTTON COUNTY—T 2s, R 9w, Sec. 33, C. E. Crane's Sturgeon 1, c nw ne, sd 3505 ft, abn.

TILLMAN COUNTY—T 3s, R 18w, Sec. 29, Dixie Oil Co.'s Harrison 1, ne cor nw, rig and tools.

COTTON COUNTY—T 3s, R 10w, Sec. 11, E. J. Stumpf's Jones 1, nw cor ne, lcn.

STEPHENS COUNTY—T 3s, R 8w, Sec. 26, E. J. Stumpf's Simon 1, sw cor, rig.

COTTON COUNTY—T 4s, R 12w, Sec. 16, Guiler & Pyson's Thomas 1, se cor sw; show oil and gas 1252-54 ft, sd 1930 ft.

TILLMAN COUNTY—T 5s, R 15w, Sec. 3, A. M. Pearson's Indian 2, sw cor, (twin No. 1), dr 2868 ft.

JEFFERSON COUNTY—T 6s, R 7w, Sec. 5, Dye & Fritz, Barnett 1, c se se, td 2269 ft, dry and abn.

JOHNSTON COUNTY—T 1s, R 7e, Sec. 29, Smithy & Kinsley's Lane 1, se cor nw, sd 1080 ft.

CARTER COUNTY—T 4s, R 2e, Sec. 32, Texokla Drlg. Co.'s Anderson 1, se ne se, rig. T 5s, R 3w, Sec. 19, Devonian Oil Co.'s Myer 1, nw cor se, lcn.

BRYAN COUNTY—T 9s, R 9e, Sec. 36, W. G. Endicott's Craig 1, c nw ne, dr 480 ft.

NORTH LOUISIANA
Completions

Company, Well and Location	Initial Production Bbls.	Depth
BOSSIER PARISH—		
Ark. Nat. Gas Corp., Wilkinson 1, 5-22-11	*	3068
BIENVILLE PARISH—		
Baca Dr. Co., State 1, 16-16-10w	*	2561
CADDO PARISH—		
Woodley Pet. Co., Whitehurst 2, 7-16-12	¶6½	2475
CLAIBORNE PARISH—		
C. T. Lue, Taylor 1, 29-22-6	*	....
UNION PARISH—		
H. C. McDonald, Union Sawmill 1, 18-23-1e	*	2305
WEBSTER PARISH—		
Virgil Helm, Maxwell 1, 7-22-9	¶9½	2680
Magnolia Pet. Co., W. P. Bond 1, 5-22-9	¶6¾	2619
Ohio Oil Co., Haynes 1, 30-23-9	*	2709

BIENVILLE PARISH—Baca Drilling Co.'s State 1, 16-16-10w, dry abn, 2561 ft. S. P. Borden's L. & A. 2, sd wo 2560 ft. W. G. Gray, Tr.'s, Johnson 1, dr 2252 ft. W. P. Wallace's Ashley 1, 15-16-10, rig up.

BOSSIER PARISH — Big Ben Oil Co.'s Stewart 1, 15-18-12, ru wo. Doern et al's Bolinger 1, 9-22-11, sd 4317 ft. Nell & Lanier's Biedenharm 1, 23-21-14, lcn. Northwest La. Gas Co.'s Pinewoods Lbr. Co. 7, 33-23-11, wosr 3041 ft. Triangle Drilling Co.'s Bulkley 1, 9-20-13, dr 4285 ft. Walker et al's Antrim 1, 28-22-13, sd 2985 ft.

CADDO PARISH—Tidal Oil Co.'s McGrary 1, 23-19-16, sd for water 1710 ft.

CATAHOULA PARISH—Lochnager O. & G. Co.'s Taliaferro 1, 26-9-6e, sd 900 ft.

Quick on The Trigger

LOW and swift they came in just above the cypress. So sudden was their approach that the tenderfoot moved.

The leader swerved first. No hope here for them to come back to the decoys. It's now or never with this drove.

One man got four, the other missed. It was not a matter of aim. Both had broken eighty-five behind the traps. But the one was slow and deliberate and emergencies rattled him. The other, alert and quick moving, was at his best when the challenge was for speed.

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CLAIBORNE PARISH—C. T. Lue's Taylor 1, 29-22-6, lcn abn, will not dr. Dixie Oil Co.'s Gilbert 1, 27-21-5w, cemtd 6⅝-inch casing at 4201 ft. El Dorado Chief Oil Co.'s Baker 1, 26-20-7, sd 2080 ft. Smitherman & McDonald's Miller 1, 17-23-8, dr 3901 ft.

DE SOTO PARISH — Benedum & Trees' State 1, 22-14-12, dr 2455 ft. Benson O. & G. Co.'s Jackson 1, 3-10-13, rig up. Case, Tr.'s, Boatright 1, 3-10-13, dr 450 ft. Carlton Drilling Co.'s Stephens 2, 12-11-16, sd 350 ft. R. O. Roy's Sample 1, 1-13-14, rig up. Whittaker 1, 4-13-13, arr to deepen, td 2834 ft. Thorn Oil Co.'s Burford 1, 22-14-14, dk. Warren & Carruthers' Ramsey 1, 33-13-16, dr 2000 ft.

EAST CARROLL — Palmer Corp.'s Carroll Land Co. 1, 21-19-11e, dr 3087 ft.

FRANKLIN PARISH—Davis et al's Moore 1, 12-11-6e, sd 1000 ft.

MADISON PARISH — Mid-American Pet. Co.'s Yerger 2, 51-16-14e, sd 285 ft.

MOREHOUSE PARISH — United Carbon Co.'s Bastrop 1, 18-21-6e, sd 3175 ft.

NATCHITOCHES PARISH — Robeline O. & G. Co.'s Cassady 1, 7-8-9w, sd 1100 ft.

OUACHITA PARISH—G. E. Jordan's Wall 1, 12-18-3e, ream to test, td 3270 ft. Ouachita Nat. Gas Co.'s D'Arbonne B-2, 25-19-2e, dr 2986 ft. Phillips et al's School Fee 1, 16-16-4e, dr 2185 ft.

RED RIVER PARISH — Rock Pet. Co.'s Pierson 1, 12-14-11, ream to set liner 9 ft sand 1761 ft.

RICHLAND PARISH — Ruston Drilling Co.'s Etheridge 1, 28-17-6e, lcn. Wilson et al's Buie 1, 17-15-7e, rig up.

RAPIDES PARISH — G. E. Silbertson's Willemach 3, 13-5n-4w, sd 2250 ft. Glenmora Pet. Co.'s Fee 1, 1-2n-2w, sd 3850 ft.

SABINE PARISH—Doern et al's Pickering Lbr. Co. 1, 17-4-11, dr 4425 ft. R. L. Gay, Tr.'s Bowman-Hicks 2, 14-7-14, set liner after well made oil by heads, est. 25 to 50 bbls day, td 2130 ft. Texas Co.'s Hamlin 1, 28-10-13, dr 4029 ft. W. J. Garnier, Tr.'s Bowman-Hicks 1, 16-7-12, lcn.

TENSAS PARISH—Enochs et al's Curry 1, 39-11-12e, sd 3583 ft.

UNION PARISH—McDonald Bros.' Frost-Johnson 1, 18-23-1e, lcn; Frost-Johnson 2, 18-23-1e, lcn. Carter & Wingfield's Clark B-1, 17-23-1e, lcn; Clark 4, 7-23-1e, lcn; Clark A-3, 8-23-1e, dk; Hudson 2, 7-23-1e, sd 2190 ft; Hudson 3, 7-23-1e, tested sw show oil, wo 2260 ft; Security Trust 2, 7-23-1e, lcn; Security Trust 3, 28-23-1w, dr 3130 ft. G. E. Carmatte's Tugwell 2, 21-22-1e, moving in rig. R. W. Rhodes' Upshaw 1, 14-23-2w, dk. H. C. McDonald's Union Sawmill 1, 18-23-1e, salt water, abn, td 2305 ft.

WEBSTER PARISH — Virgil Helm's Maxwell 1, 7-22-9, 9½ mil ft gas, td 2680 ft. Magnolia Pet. Co.'s W. P. Bond 1, 5-22-9, 6,730,000 ft gas, td 2619 ft. Ohio Oil Co.'s Haynes 1, 30-23-9, salt water, abn, td 2709 ft. Jones et al's Elkins 1, 33-23-9, temp. abn, 2690 ft. Magnolia Pet. Co.'s H. H. Branton 1, 5-22-9, rig up. M. Branton 1, 5-22-9, dr 924 ft; Scroggins 1, 1-22-11, dr 2462 ft. Harry Morris' Lewis 1, 15-23-9, sd 2902 ft. Northwest La. Gas Co.'s Pinewoods Lbr. Co., 8, 37-23-11, temp. abn 3418 ft.

EAST TEXAS

Completions

RED RIVER COUNTY—
Bert Longenheim's Atkinson 1, Lonson-Moore sur ..... * 1065

CASS COUNTY—Davis & Pigg's Ed Lambert 1, Lambert sur, sd wo 1952 ft.

CAMP COUNTY—Rogers et al's Enfelt 1, Montgomery sur, sd wo 1978 ft.

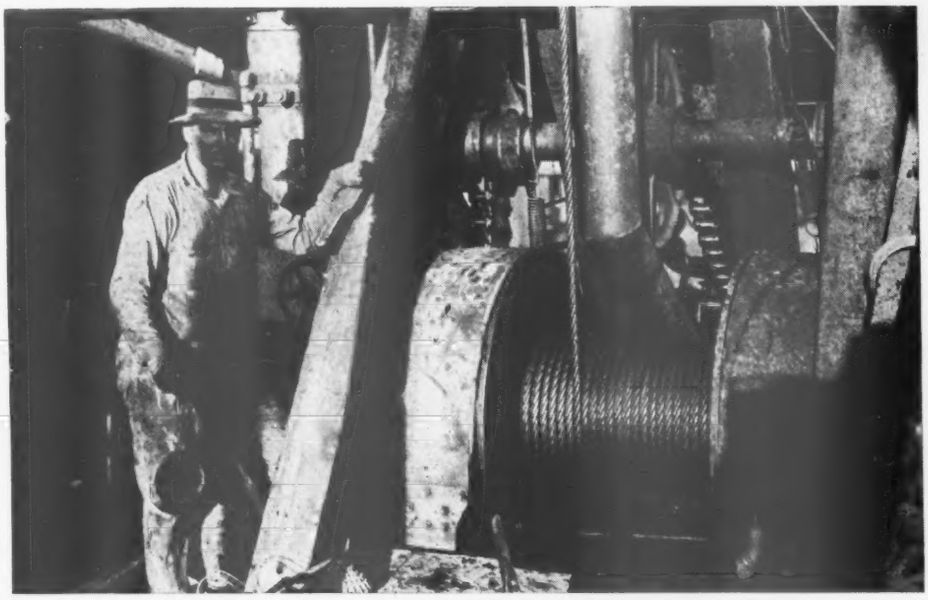
BOWIE COUNTY—Hooks O. & G. Co.'s Rosenberg 1, King sur, temp. abn 3086 ft.

RED RIVER COUNTY—Bert Longenheim's Atkinson 1, Lonson-Moore sur, dry abn 1065 ft. Shad Harper's Garland 1, Jos. Wagley sur, sd wt on fuel, 1590 ft. D. M. Buffington's Hoosier 1, Hughart sur, dr 1080 ft. Johnson Pet. Co.'s Randolph 2, Dean sur, dr 1425 ft.

SHELBY COUNTY—Gulf Ref. Co.'s Pickering Lbr. Co. 1, G. H. Patterson sur, killed with baroids at 3382 ft after flowing oil 14 days, coring 3400 ft. Chapparral Oil Co.'s Holt 2, Matthew Moore sur, dr 1850 ft.

UPSHUR COUNTY—F. S. Freeland's Newsom 1, Butler sur, arr d.s. test 2020 ft; Hudspeth 1, Jackson sur, dk pat.

AMERICAN WIRE LINES



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INTERNATIONAL

Supply Company

NORTHERN CALIFORNIA

Completions

Company, Well and Location	Initial Production Bbls.	Depth
VENTURA COUNTY—		
Shell Co.'s Grub 1, 22-2-22	•	5310

KERN COUNTY

BUTTONWILLOW — Milham Exploration Co.'s Wisnom 1, 16-28-23, dr shale 4277 ft. Doheny-Stone Drilling Corp.'s Salisbury 1, 7-29-24, fsh removed, td 4260 ft.

COMANCHE POINT—W. W. Stabler's Tejon 1, 23-22-29, plugged to 2520 ft, will re-dr.

DELANO—S. A. Delzell's Vedder 1, 4-26-27, sd 3115 ft.

EDISON—General Pet. Corp.'s Seale 10, 5-30-29, sd 3750 ft.

GOULD HILLS—Bomke and Ball's L-1, 19-29-20, dr shale and sand 600 ft. Exeter Oil Co.'s Pray 2, 1-29-20, dr 80 ft. Ozena Oil Co.'s 1, 27-29-21, producing water and some oil, td 2930 ft.

SHALE HILLS—Margaret M. Young's 1, 6-27-10, new lcn.

RIO BRAVO—Elmer Oil Co.'s 1, 8-28-25, dr shale 3900 ft.

SAN EMIDIO—Standard's KCL-1, 35-11-22, fsh for dr pipe 3015 ft. Union Oil Co.'s KCL-1, rigging rotary.

SEMITROPIC—Richfield's Kerwin 1, 21-26-22, dr shale and sand 4600 ft.

SANTA BARBARA COUNTY

CARPENTERIA—Continental's Franklin 1, plugged to 1400 ft for re-dr.

POINT ARQUELLO—Standard's Sudden 1, new lcn.

REFUGIO—Shell's Rutherford 1, 31-5-30, rig.

SANTA BARBARA—Channell Oil and Dev. Co.'s 1, 29-4-27, swabbing water 6290 ft. Southwest Production Co.'s 1, 2-4-28, dr shale 1875 ft.

TORTUGA CANYON—Standard's Schyvers 1, rig.

VENTURA COUNTY

Triple A Investment Co.'s Elkins 1, 28-4-9, plugged to 2890 ft for prod. test.

OJAI—R. E. Burke's McDonnell 1, 11-4-23, fsh for dr pipe 2950 ft. Continental's Fox 1-M, 21-4-22, dr shale 2625 ft; Thompson 1, 22-4-22, dr shale 2820 ft, 8¼-in cas pulled. E. J. Miley's Casitas 1, 12-3-21, plugged to 600 ft. Rancho-Riva et al's 1, 28-4-23, fsh 250 ft.

PIRU—Bolsa Chica Oil Corp.'s Hidden 1, 5-4-18, lcn. Petroleum Securities Co.'s Diablo 1, 26-5-10, dr shale 6400 ft. Rio Grande Oil Co.'s BBN-1, 13-4-9, dr 2170 ft. Wasibi Oil Co.'s Bishop 2, 34-3-19, dr shale 2800 ft.

SANTA PAULA—W. W. Bryant's Anlauf 3, 21-4-21, dr shale 525 ft. San Pedro-Pt. Fermin Syn.'s Kellerman 1, 13-4-21, co 675 ft.

SATICOY—Ohio Oil Co.'s Alexander 1, 32-3-21, dr shale and sand 350 ft. Standard's Citrus 1, 1-2-22, dr 3600 ft.

SIMI—Shell's Marr 1, 31-3-17, new lcn. E. F. Exline's Seaton 1, 32-5-21, fsh 2075 ft. Pirate Oil Co.'s 1, 33-3-21, rig.

SOUTH MOUNTAIN — Ring Pet. Corp.'s

THE type of clutch developed by this Company for heavy duty work is proving itself well adapted to oil field conditions. It stands up under the most severe service. This Climax powered gas compressor is a case in point, illustrating the combination of extreme flexibility with rugged strength for which Twin Disc clutches are famous.

We are well equipped to serve manufacturers of oil field production equipment. The experience of our engineers is at your disposal. Write.

TWIN DISC CLUTCH COMPANY

RACINE WISCONSIN

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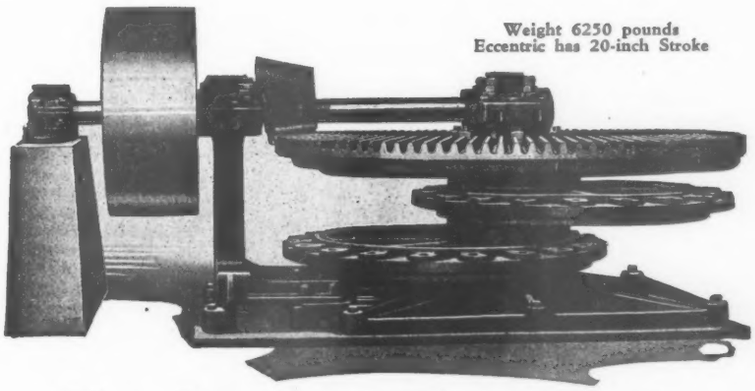

Weight 6250 pounds
Eccentric has 20-inch Stroke

Now Equipped with Automatic Pump Lubrication

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- High Pressure Tanks
- Howe Casing Heads

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THE power illustrated above is conceded to be one of the most powerfully geared powers on the market. A very heavy under-pull power with two eccentrics, each having a 20-in. stroke. The pinion shaft is supported on three bearings, which is a very important point, because tight belts soon pull ordinary powers out of line, resulting in broken gears.

This power is geared eight to one, the pinion is steel, and we have never had one fail on the heaviest of loads.

We recommend this power in place of the usual band wheel powers, and their expensive installation. If desired, we can furnish this power with one eccentric.

Write for prices, or inquire of any of our representatives

The Pattin Brothers Company

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A. S. Dunnington	J. Barnes	J. W. Noland	Putnam Supply Co.	The Blaisdell Machinery Co.

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Wright Manufacturing Co.
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Largest Supply House in the Southwest

PEDEN IRON & STEEL CO.
HOUSTON – SAN ANTONIO – SHREVEPORT

Converse 1, 3-3-21, dr oil sand and shale 4812 ft.

MISCELLANEOUS

FRESNO COUNTY—C. C. Boatwright's 1, 27-19-19, rigging rotary. Currency Pet. Co.'s 1, 28-21-14, dr shale 450 ft.

MADERA COUNTY — Madera Oil & Gas Co.'s 1, 35-13-7, sd 210 ft.

SAN LUIS OBISPO COUNTY — Canyon Oil Co.'s 1, 11-31-11, dr shale and sand 665 ft. Panorama Oil Co.'s 1, 7-31-21, dr shale 3160 ft. Union's Russ 1, 34-32-15, dr shale 3235 ft; Chandler 1, 12-32-15, dr hard sand 2277 ft.

SAN MATEO COUNTY—Shell's Butts 1, 21-6-5, sd 3370 ft.

SONOMA COUNTY—Shell's Doss 1, 29-5-6, dr sand 1550 ft.

TULARE COUNTY—Kings-Tulare Syn.'s 1, 19-21-23, dr on 4¾-in cas, td 5650 ft.

SOUTHERN CALIFORNIA

BELLFLOWER—World Pet. Corp.'s Blythe 1, sd 2915 ft.

CHATSWORTH — Russell Pet. Corp.'s Joughin 1, sd 625 ft, fire damaged rig.

COSTA MESA—Nesa Pet. Corp.'s B. G. 1, co 3200 ft, will deepen.

DOWNEY—Associated Oil Co.'s Taylor 1, 11-in cas cmt 3990 ft, td 5035 ft.

HUNTINGTON BEACH—Western Drilling and Producing Co.'s 1, sr shale 2744 ft.

FULLERTON—Shell Co.'s Stern 1-1, made production test at 6300 ft, well would not flow, may be plugged back to produce at 5900 ft.

GARDEN GROVE—The Texas Co.'s Crawford 1, 18-in cas cmt 975 ft.

INGLEWOOD—California-Eastern Oil Co.'s Pollard 1, ready to sp.

MAYWOOD — Richfield Oil Co.'s Community 1, sp.

MONTEREY PARK—Monterey Park Pet. Co.'s 1, dr shale and sand 3775 ft.

NEWHALL — California-Eastern Oil Co.'s Hasley 1, dr hard sand 2200 ft.

POMONA—Pomona Oil Assn's Community 1, sd 925 ft.

PUENTE HILLS—Anchor Pet. Co.'s Hudson 1, plugged to 3800 ft, td 4825 ft. Richfield's Didier 1, dr hard sand 2330 ft.

RIVERA—Empire Drilling Co.'s Purman 1, sd 4500 ft, may abn.

SAN FERNANDO — Shell's Mission 2, dr hard sand 5660 ft.

STANTON—Fred F. Steele's Everhardy 1, rig.

SAN BERNARDINO COUNTY — Western Pacific Oil Co.'s 3, dr shale and sand 3225 ft.

RIVERSIDE COUNTY — Hall Pet. Co.'s Watt 1, pulling 8¼-in cas 860 ft.

ARKANSAS

Completions

Company, Well and Location	Initial Production Bbls.	Depth
CLARK COUNTY—		
McKenzie Oil Co., Eakin 1- 9-11-19..	*	1700
LINCOLN COUNTY—		
Pine Prairie O. & G. Co., Carter 1, 33-10-6	*	2126

ASHLEY COUNTY—Atlantic O. P. Co.'s Moffatt 1, 28-16-8, ream to bottom 3864 ft. C. E. Harris et al's Holmes 1, 9-16-7, sd 151 ft.

BRADLEY COUNTY—Ohio Oil Co.'s Southern Lbr. Co. 2, 19-16-9, rig.

CLARK COUNTY — McKenzie Oil Co.'s Eakin 1, 9-11-19, junked abn 1700 ft. Wm. Henry, Tr.'s Clark 1, 34-9-21, sd 1385 ft.

CALHOUN COUNTY — Joe Hurley's Ark. Land & Timber Co. 1, 29-16-12, rig up.

CHICOT COUNTY—W. S. Smith's Meyer 1, 14-19-2, sd 850 ft. Joe Crawford's Cashion 1, 14-18-2, dr 2330 ft. S. D. Hunter's Sawyer 1, 19-18-2, fsh d.s. 3321 ft.

COLUMBIA COUNTY — G. W. Dawley's Fullenwider & Kitchen 1, 12-17-22, sd wo 2847 ft.

DALLAS COUNTY — Robt. H. Dedman's Hillman 1, 20-10-13, temp abn 1145 ft.

FAULKNER COUNTY—Gold Creek O. & G. Co.'s Stermer 1, 17-4-13, sd 3462 ft.

FRANKLIN COUNTY — Ozark Nat. Gas Co.'s McElroy 1, 15-8-27, lcn.

GARLAND COUNTY—H. H. Given's Garrett 1, 1-3-19w, temp abn 2800 ft.

LINCOLN COUNTY—Pine Prairie O. & G. Co.'s Carter 1, 33-10-6, dr, abn 2126 ft.

LOGAN COUNTY—Ark. Nat. Gas Corp.'s

SMITH BROS., INC.

General Contractors

DALLAS ~ HOUSTON

W. H. Parks 1, 26-8-24, trying to get by 8-in cas at 2361 ft, td 3208 ft.

MILLER COUNTY — E. A. Martin, Tr.'s Dale 4, 23-15-26, rig up.

OUACHITA COUNTY — McDonald Bros.' Wilson 1, 25-15-18, sd 2827 ft. Little Fay Oil Co.'s Primm 2, 23-15-16, set liner 2050 ft. Primm 3, 24-15-16, rig up.

UNION COUNTY—Calgo Oil Co.'s Primm 1, 9-18-17, tested dry through d.s. 3365-3395 ft, coring 3475 ft, (erroneously carried Columbia county.) McDonald Bros.' Mayfield 1, 29-19-15, laying fuel line, td 1990 ft. Stark et al's Powell 1, 35-18-15, tested 24 fourbles sw through dr 2665-73 ft. Imperial O. & G. Co.'s Goodwin 1, 26-17-16, dr 2915 ft. J. P. Hawkins et al's Goodwin 1, 6-17-15, dr 980 ft. Tharpe Drilling Co.'s List 1, 25-17-15, sd 3050 ft. Foster et al's Murphy Land Co. 1, 22-17-17, rig up, wo. Grimes Bros.' Hill 2, 7-18-14, rig up, wo. Tate & Morefield's W. W. Smith 1, 6-18-13, sd for fuel, td 3060 ft. J. C. Marcum's DeYambert 1, 5-19-14, sd 2025 ft.

KANSAS

BARBER COUNTY — Barbara Oil Co.'s Blunk 1, c ne nw, 20-34-13w, st reaming 4755 ft.

BARTON COUNTY—McJilton et al's Evanston 1, se nw, 34-17-11w, rig.

BUTLER COUNTY—La Robb et al's Bronsenger 1, ne sw, 24-27-3, ru.

CHASE COUNTY—Griener & Fowler's Carson 1, ne ne, 9-21-7, sd 3150 ft.

CLAY COUNTY—Roth & Faurot's Bradbery 1, se nw, 21-9-4e, sd 1775 ft, show oil and water.

COWLEY COUNTY—Pyle & Sutter's Lindstrum 1, se ne, 9-35-4e, fsh tools 900 ft. Empire-Marland-Twin State's Feaster 1, nw ne, 36-32-5e, d 1890 ft.

EDWARDS COUNTY—Amerada-Wilcox O. & G. Co.'s Teansil 1, nw cor, 32-25-19w, d 3565 ft.

ELLIS COUNTY—Rush Oil Co.'s Gatewood 1, nw nw, 4-15-20w, sd 1100 ft. Empire's Wann 1, ne, 31-12-19w, d 2850 ft. Marland's Vine 1, sw se, 27-11-19w, 8-in cas 2812 ft. Transcontinental's Boetcher 1, nw se sw, 21-13-19w, sd 3523 ft. Phillips' Brull 1, c nw¼, 34-14-17w, sp sd. Phillips' Shutts 1, ne¼, 5-12-17w, sd 3575 ft, swabbed 350 bbls. Phillips' Schmeidler 1, nw cor, 20-12-17w, rig. Phillips' Legleiter 1, c ne nw se, 10-16-18w, rig. Labette Oil Co.'s Urbank 1, ne nw nw, 19-15-16w, d 3060 ft. T. B. Slick's Craig 1, cnw ne, 8-11-16w, sd 3097 ft, no show. Thomas Moncrief's Johnson 1, sw ne, 9-13-19w, su. Derby and Empire's Krause 1, se nw sw, 17-14-19w, d 3487 ft. Finney & Weimer's Freeman 1, nwc, 24-15-20w, sp sd.

GEARY COUNTY—Pioneer Oil Co.'s Chase 1, se se, 19-12-7, d 3570 ft.

GREENWOOD COUNTY—P. H. Baullieu's Bright 1, ne sw, 22-27-12, sd 1270 ft.

HARPER COUNTY—Amerada's Mendiville 1, c se se, 24-34-6w, co 5340 ft, td 5360 ft. Sam Jarvis' Warneke 1, se sw, 4-34-3w.

JEFFERSON COUNTY—Wichita Oil Co.'s Simpson 1, nw sw sw 19-10-17, ru sd.

LANE COUNTY—Robinson et al's Dickerson 1, sw nw se, 11-18-27w, 8-in 2625 ft.

MARION COUNTY—Empire's Jensen 1, se nw, 26-22-5e, d 1000 ft.

MARSHALL COUNTY—Irwin et al's Cooper 1, ne nw, 10-3-7e, sp.

MITCHELL COUNTY—Ben Gurley et al's Crombil 1, c ne ne, 32-9-7w, hfw 3685-95 ft.

MORRIS COUNTY—Hugh Faulder's Wendt 1, sw se se, 18-15-5e, rig. Skelton et al's Iles 1, nw nw, 25-16-5e, rig.

McPHERSON COUNTY — Galt-Brown's Blaine 1, c ne, 18-17-1w, Wx 3305-30 ft, hfw abn. McPherson Co. Gas Co.'s Stein 1, sw ne sw, 17-18-1w, d 2863 ft. McPherson County Gas Co.'s Gustafson 1, cne¼, 9-17-2e, sd 2943 ft. Ted Washabaugh's Vossheil 1, ne ne, 9-21-3w, sd 400 ft. Amerada's Rosberg 1, sw se nw, 31-18-3w, sp.

OTTAWA COUNTY—Anderson et al's Bank 1, ne nw, 28-10-2w, d 2790 ft.

PAWNEE COUNTY—F. C. Troupe's Lovett 1, cel ne ne, 31-21-16w, sd 1560 ft.

PHILLIPS COUNTY—Watsonian Oil Co.'s Marklein 1, ne sw, 21-3-19w, d 2710 ft.

RICE COUNTY—Allison & Fitzwilliams' Poland 1, ne sw ne, 36-19-8w, cellar.

ROOKS COUNTY—Empire's Dodrill 1, ne se nw, 15-8-18w. Krueger et al's Poore 1, ne ne, 14-8-16w, sd 3140 ft. Prairie's Sandberg 1, c sw¼, 20-9-18w, rig.

RUSH COUNTY — Valerious & Cheney's Sheverman 1, nw se nw, 27-17-17w, 11½M gas 3579 ft. Sinclair's Beiching 1, nw ne nw, 9-16-16w, 8-in 2940 ft.

RUSSELL COUNTY — Midwest Ex. Co.'s Austin 1, ne ne, 36-12-16, d 3045 ft by pipe.

SALINE COUNTY—M. Esty et al's Peterson 1, c ne, 6-16-5w, sp and sd. Nathan-Jones et al's Robertson 1, nw sw, 27-14-2w, ur 8-in cas 2500 ft.

SEDGWICK COUNTY—La Robb Oil Co.'s Davis 1, ne sw se, 36-25-1w, d 2705 ft. Bu-Vi-Bar Oil Co.'s Steel 1, se cor, 1-26-2w, d 2685 ft. Barnsdall's Samuels 1, ne nw, 24-25-1e, fsh tools 1400 ft. Barnsdall's Faber 1, sw nw, 6-27-1w, d 2245 ft. Allison & Fitzwilliams' Doane 1, ne nw ne, 24-26-1w, Wx 3430-32, hfw abn. Van Zandt & Mason's Fox 1, c nw sw, 19-25-1w, ur 10-in cas 2165 ft. Connell Oil Co.'s Cross 1, ne cor, 27-25-1, d 1200 ft.

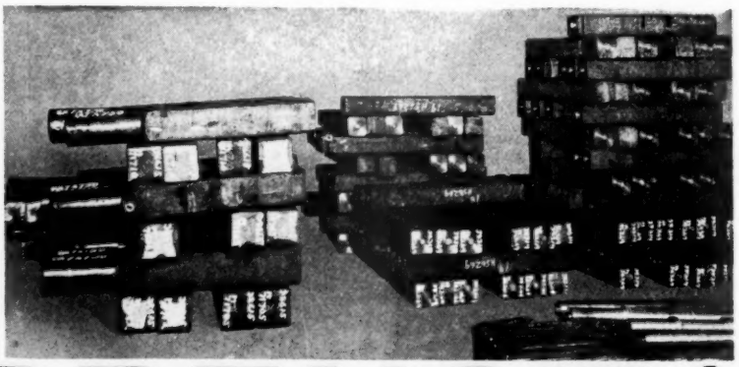
SHERMAN COUNTY—A. L. Henson et al's Murray 1, ne se nw, 22-7-40w, sd 3035 ft.

STEPHENS COUNTY—W. Sidwell et al's Kelly 1, sw ne, 16-34-38w, sd 1160 ft. Trees Oil Co.'s Unknown 1, sw ne sw, 3-35-38w, td 600 ft, pipe froze, skid.

SUMNER COUNTY—Geo. Dickey's Known 1, sw ne, 3-35-1w, Wilcox 4244-48 ft, hfw. Gypsy's Williams 1, nw se sw, 16-35-3w, hfw 3680-3712 ft, d 397 ft. McCulloch et al's Tuttle 1, sw ne, 29-34-1w, 6-in cas 4160 ft. Otstot et al's Volker 1, nw ne, 9-35-1e, rig. Helmerich & Payne's Warlick 1, se ne, 8-34-2e, d 3065 ft. Davidson et al's Strickland 1, sw se, 12-35-1w, rig. Roland et al's Pickens 1, ne nw ne, 27-30-14w, d 4132 ft.

TREGO COUNTY—Central Commercial Oil Co.'s Ellis 1, ne sw ne, 20-13-21w, d 2776.

WASHINGTON COUNTY—McCool & Vincent's Linn 1, nw ne, 27-4-3e, ru.



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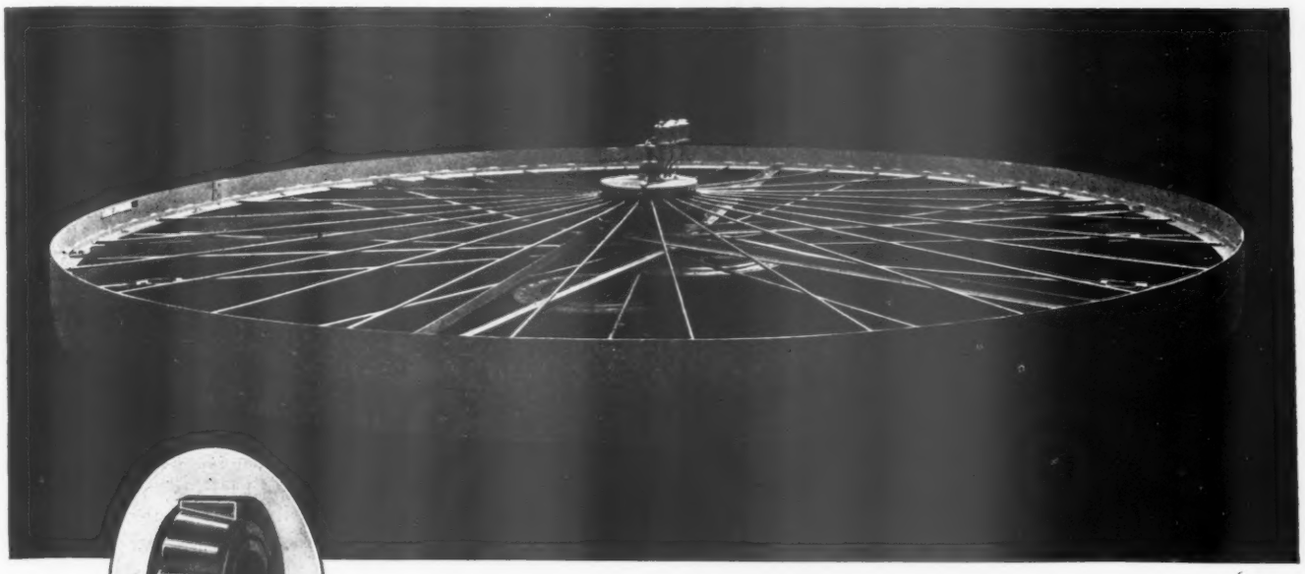

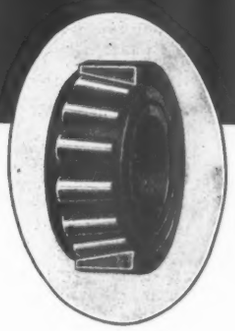

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PEDEN IRON & STEEL CO.
HOUSTON – SAN ANTONIO – SHREVEPORT

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CLARK COUNTY — McKenzie Oil Co.'s Eakin 1, 9-11-19, junked abn 1700 ft. Wm. Henry, Tr.'s Clark 1, 34-9-21, sd 1385 ft.

CALHOUN COUNTY — Joe Hurley's Ark. Land & Timber Co. 1, 29-16-12, rig up.

CHICOT COUNTY—W. S. Smith's Meyer 1, 14-19-2, sd 850 ft. Joe Crawford's Cashion 1, 14-18-2, dr 2330 ft. S. D. Hunter's Sawyer 1, 19-18-2, fsh d.s. 3321 ft.

COLUMBIA COUNTY — G. W. Dawley's Fullenwider & Kitchen 1, 12-17-22, sd wo 2847 ft.

DALLAS COUNTY — Robt. H. Dedman's Hillman 1, 20-10-13, temp abn 1145 ft.

FAULKNER COUNTY—Gold Creek O. & G. Co.'s Stermer 1, 17-4-13, sd 3462 ft.

FRANKLIN COUNTY — Ozark Nat. Gas Co.'s McElroy 1, 15-8-27, lcn.

GARLAND COUNTY—H. H. Given's Garrett 1, 1-3-19w, temp abn 2800 ft.

LINCOLN COUNTY—Pine Prairie O. & G. Co.'s Carter 1, 33-10-6, dr, abn 2126 ft.

LOGAN COUNTY—Ark. Nat. Gas Corp.'s

SMITH BROS., INC.

General Contractors

DALLAS ~ HOUSTON

W. H. Parks 1, 26-8-24, trying to get by 8-in cas at 2361 ft, td 3208 ft.

MILLER COUNTY — E. A. Martin, Tr.'s Dale 4, 23-15-26, rig up.

OUACHITA COUNTY — McDonald Bros.' Wilson 1, 25-15-18, sd 2827 ft. Little Fay Oil Co.'s Primm 2, 23-15-16, set liner 2050 ft. Primm 3, 24-15-16, rig up.

UNION COUNTY—Calgo Oil Co.'s Primm 1, 9-18-17, tested dry through d.s. 3365-3395 ft, coring 3475 ft, (erroneously carried Columbia county.) McDonald Bros.' Mayfield 1, 29-19-15, laying fuel line, td 1990 ft. Stark et al's Powell 1, 35-18-15, tested 24 fourbles sw through dr 2665-73 ft. Imperial O. & G. Co.'s Goodwin 1, 26-17-16, dr 2915 ft. J. P. Hawkins et al's Goodwin 1, 6-17-15, dr 980 ft. Tharpe Drilling Co.'s List 1, 25-17-15, sd 3050 ft. Foster et al's Murphy Land Co. 1, 22-17-17, rig up, wo. Grimes Bros.' Hill 2, 7-18-14, rig up, wo. Tate & Morefield's W. W. Smith 1, 6-18-13, sd for fuel, td 3060 ft. J. C. Marcum's DeYambert 1, 5-19-14, sd 2025 ft.

KANSAS

BARBER COUNTY — Barbara Oil Co.'s Blunk 1, c ne nw, 20-34-13w, st reaming 4755 ft.

BARTON COUNTY—McJilton et al's Evanston 1, se nw, 34-17-11w, rig.

BUTLER COUNTY—La Robb et al's Bronsenger 1, ne sw, 24-27-3, ru.

CHASE COUNTY—Griener & Fowler's Carson 1, ne ne, 9-21-7, sd 3150 ft.

CLAY COUNTY—Roth & Faurot's Bradbery 1, se nw, 21-9-4e, sd 1775 ft, show oil and water.

COWLEY COUNTY—Pyle & Sutter's Lindstrum 1, se ne, 9-35-4e, fsh tools 900 ft. Empire-Marland-Twin State's Feaster 1, nw ne, 36-32-5e, d 1890 ft.

EDWARDS COUNTY—Amerada-Wilcox O. & G. Co.'s Teansil 1, nw cor, 32-25-19w, d 3565 ft.

ELLIS COUNTY—Rush Oil Co.'s Gatewood 1, nw nw, 4-15-20w, sd 1100 ft. Empire's Wann 1, ne, 31-12-19w, d 2850 ft. Marland's Vine 1, sw se, 27-11-19w, 8-in cas 2812 ft. Transcontinental's Boetcher 1, nw se sw, 21-13-19w, sd 3523 ft. Phillips' Brull 1, c nw¼, 34-14-17w, sp sd. Phillips' Shutts 1, ne¼, 5-12-17w, sd 3575 ft, swabbed 350 bbls. Phillips' Schmeidler 1, nw cor, 20-12-17w, rig. Phillips' Legleiter 1, c ne nw se, 10-16-18w, rig. Labette Oil Co.'s Urbank 1, ne nw nw, 19-15-16w, d 3060 ft. T. B. Slick's Craig 1, cnw ne, 8-11-16w, sd 3097 ft, no show. Thomas Moncrief's Johnson 1, sw ne, 9-13-19w, su. Derby and Empire's Krause 1, se nw sw, 17-14-19w, d 3487 ft. Finney & Weimer's Freeman 1, nwc, 24-15-20w, sp sd.

GEARY COUNTY—Pioneer Oil Co.'s Chase 1, se se, 19-12-7, d 3570 ft.

GREENWOOD COUNTY—P. H. Baullieu's Bright 1, ne sw, 22-27-12, sd 1270 ft.

HARPER COUNTY—Amerada's Mendiville 1, c se se, 24-34-6w, co 5340 ft, td 5360 ft. Sam Jarvis' Warneke 1, se sw, 4-34-3w.

JEFFERSON COUNTY—Wichita Oil Co.'s Simpson 1, nw sw sw 19-10-17, ru sd.

LANE COUNTY—Robinson et al's Dickerson 1, sw nw se, 11-18-27w, 8-in 2625 ft.

MARION COUNTY—Empire's Jensen 1, se nw, 26-22-5e, d 1000 ft.

MARSHALL COUNTY—Irwin et al's Cooper 1, ne nw, 10-3-7e, sp.

MITCHELL COUNTY—Ben Gurley et al's Crombil 1, c ne ne, 32-9-7w, hfw 3685-95 ft.

MORRIS COUNTY—Hugh Faulder's Wendt 1, sw se se, 18-15-5e, rig. Skelton et al's Iles 1, nw nw, 25-16-5e, rig.

McPHERSON COUNTY — Galt-Brown's Blaine 1, c ne, 18-17-1w, Wx 3305-30 ft, hfw abn. McPherson Co. Gas Co.'s Stein 1, sw ne sw, 17-18-1w, d 2863 ft. McPherson County Gas Co.'s Gustafson 1, cne¼, 9-17-2e, sd 2943 ft. Ted Washabaugh's Vosshell 1, ne ne, 9-21-3w, sd 400 ft. Amerada's Rosberg 1, sw se nw, 31-18-3w, sp.

OTTAWA COUNTY—Anderson et al's Bank 1, ne nw, 28-10-2w, d 2790 ft.

PAWNEE COUNTY—F. C. Troupe's Lovett 1, cel ne ne, 31-21-16w, sd 1560 ft.

PHILLIPS COUNTY—Watsonian Oil Co.'s Marklein 1, ne sw, 21-3-19w, d 2710 ft.

RICE COUNTY—Allison & Fitzwilliams' Poland 1, ne sw ne, 36-19-8w, cellar.

ROOKS COUNTY—Empire's Dodrill 1, ne se nw, 15-8-18w. Krueger et al's Poore 1, ne ne, 14-8-16w, sd 3140 ft. Prairie's Sandberg 1, c sw¼, 20-9-18w, rig.

RUSH COUNTY — Valerious & Cheney's Sheverman 1, nw se nw, 27-17-17w, 11½M gas 3579 ft. Sinclair's Beiching 1, nw ne nw, 9-16-16w, 8-in 2940 ft.

RUSSELL COUNTY — Midwest Ex. Co.'s Austin 1, ne ne, 36-12-16, d 3045 ft by pipe.

SALINE COUNTY—M. Esty et al's Peterson 1, c ne, 6-16-5w, sp and sd. Nathan-Jones et al's Robertson 1, nw sw, 27-14-2w, ur 8-in cas 2500 ft.

SEDGWICK COUNTY—La Robb Oil Co.'s Davis 1, ne sw se, 36-25-1w, d 2705 ft. Bu-Vi-Bar Oil Co.'s Steel 1, se cor, 1-26-2w, d 2685 ft. Barnsdall's Samuels 1, ne nw, 24-25-1e, fsh tools 1400 ft. Barnsdall's Faber 1, sw nw, 6-27-1w, d 2245 ft. Allison & Fitzwilliams' Doane 1, ne nw ne, 24-26-1w, Wx 3430-32, hfw abn. Van Zandt & Mason's Fox 1, c nw sw, 19-25-1w, ur 10-in cas 2165 ft. Connell Oil Co.'s Cross 1, ne cor, 27-25-1, d 1200 ft.

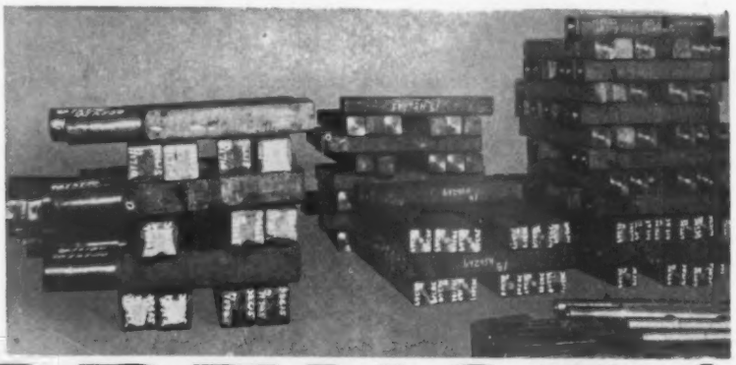
SHERMAN COUNTY—A. L. Henson et al's Murray 1, ne se nw, 22-7-40w, sd 3035 ft.

STEPHENS COUNTY—W. Sidwell et al's Kelly 1, sw ne, 16-34-38w, sd 1160 ft. Trees Oil Co.'s Unknown 1, sw ne sw, 3-35-38w, td 600 ft, pipe froze, skid.

SUMNER COUNTY—Geo. Dickey's Known 1, sw ne, 3-35-1w, Wilcox 4244-48 ft, hfw. Gypsy's Williams 1, nw se sw, 16-35-3w, hfw 3680-3712 ft, d 397 ft. McCulloch et al's Tuttle 1, sw ne, 29-34-1w, 6-in cas 4160 ft. Otstot et al's Volker 1, nw ne, 9-35-1e, rig. Helmerich & Payne's Warlick 1, se ne, 8-34-2e, d 3065 ft. Davidson et al's Strickland 1, sw se, 12-35-1w, rig. Roland et al's Pickens 1, ne nw ne, 27-30-14w, d 4132 ft.

TREGO COUNTY—Central Commercial Oil Co.'s Ellis 1, ne sw ne, 20-13-21w, d 2776.

WASHINGTON COUNTY—McCool & Vincent's Linn 1, nw ne, 27-4-3e, ru.



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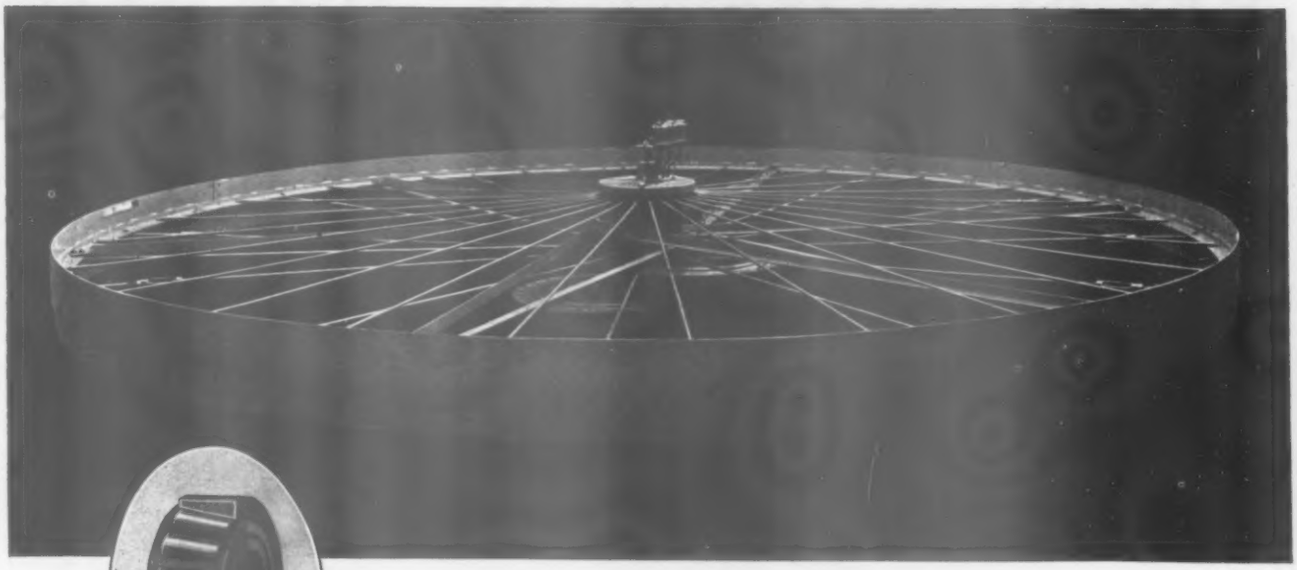

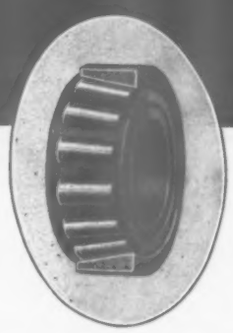

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PERMITS GRANTED FOR NEW WELLS

WEEKLY COMPARISON OF NEW WELLS

Following is a condensed table giving a comparison of permits or locations made for new wells during the past year in Kansas, Oklahoma, Arkansas, Louisiana, Texas, California and the Mountain States:

	Week ending Dec. 1	Previous week	Total this month	Total this year	This week last year	This month 1927	Total same date 1927	Year total 1927
Arkansas	6	4	6	313	4	4	308	329
California	26	24	26	1,121	36	36	1,108	1,226
Louisiana	22	16	22	640	18	18	759	812
Kansas	20	36	20	977	18	18	887	972
Oklahoma	71	71	71	3,420	55	55	3,462	3,702
Texas	175	184	175	7,569	139	139	8,134	8,665
Mountain States	..	..	..	..	..	..	431	494
Total	320	335	320	14,038	270	270	15,089	16,149

OKLAHOMA

BECKHAM COUNTY—Co-Operative Syndicate, Joyne 1, ne, 22-9-23w. Magnolia, Gray 2, c se sw, 14-9-23w.

CLEVELAND COUNTY—T. B. Slick and Phillips Pet. Co., Sudik 1, c ne ne, 8-10-2w.

COAL COUNTY—F. T. Hepburn, Richardson 1, c ne ne, 6-2n-8e.

CREEK COUNTY—Curtis Oil Co., Adams 1, nw, 15-18-9e. Roach et al, Beavers 3, se c nw nw, 35-18-9e. Ogg Pet. Co., Smith 1, se nw sw, 35-16-9e. Wilcox & Oswalt et al, Anthis 8, csl nw sw, 1-16-11e. F. A. Havel et al, Ramsey 1A, owd ne se, 10-14-10e. Hall & Donnelly, Johnson 1, owd ne se nw, 17-14-10e. Twin State Oil Co., Coachman 6, nw sw ne, 20-17-7e. Twin State Oil Co., Moachman 5, sw nw ne, 20-17-7e. Markham Oil Co., Beesley 7, ne se nw, 20-17-7e. Houston Oil Co., Bullett 3, sw ne ne, 20-17-7e.

KAY COUNTY—C. A. Leonard and H. A. G. Oil Co., Binney 3, c nw sw, 21-27-1e.

KIOWA COUNTY—Bridwell et al, Foster 1, se c nw, 18-6-16w.

MUSKOGEE COUNTY—R. & R. Drilling Co., Ragan 1, ne c 19-13-16e. Bryan & Emery, Barnett 5, cwl se ne, owd, 8-15-15e.

OKFUSKEE COUNTY—Atlantic, Micco 1, nw c sw sw, 12-10-11e. Devonian Oil Co., Fiet 5, c sw ne, 11-10-11e. Atlantic, Field 1, nw, 13-10-11e. Minnehoma Oil Co., Fixico 1, nw sw se, 20-12-10e.

OKMULGEE COUNTY — A. G. Hazlett, Tucker 6, owd, se cor nw se, 2-13-14e. W. B. Pine, Doyle 1, ne c se nw, 18-15-13e. Sidwell Drilling Co., Lunsford 3, ne c sw sw, 4-14-11e. Winemiller Oil Corp., Warren 1, sw c ne, 13-14-11e.

OSAGE COUNTY—Tidal Oil Co., No. 1, ne c nw sw, 29-21-11e. Silurian Oil Co., No. 53, se sw ne, 17-23-12e; No. 5, se nw se, 12-23-11e. A. M. Barbour, No. 1, nw c ne ne, 32-23-9e.

PAWNEE COUNTY—Hemlock Oil Co., Williams 1, ne c, 8-20-9e. Operators Oil Co., Powell 1, se c ne nw, 15-20-9e.

PONTOTOC COUNTY—Ogg Pet. Co. et al, Bolen 1, sw c, 29-5n-5e; Roberts 3, sw se sw, 29-5-5e.

POTTAWATOMIE COUNTY — Atlantic, Perry 1, ne se ne, 13-9-4e. Amerada, Ballard 1, se sw se, 1-8-4e; Hallum 2, se cor, 1-8-4; Hallum 3, sw se se, 1-8-4e. Gypsy Oil Co., Hartman 1, ne nw ne, 12-8-4e. Tidal Oil Co., Dunn 1, ne c, 12-8-4e; Runn 2, nw ne ne, 12-8-4e. Pure Oil Co., Beebee 1, se c sw, 6-8-5e. Amerada Pet. Corp., Fehlig 1, sw cor ne, 7-8-5e; Fehlig 2, se sw ne, 7-8-5e; Fehlig 3, nw c ne, 7-8-5e. Amerada and Marland, Calvin 1, nw cor, 7-8-5e. Gypsy Oil Co., Bourassa 3, sw se ne, 7-8-5e; Bourassa 4, se nen e, 7-8-5e; Bourassa 5, ne se ne, 7-8-5e. Pure Oil Co., Wiley 2, ne c nw, 7-8-5e. The Texas Co., Calvin 2, nw c se, 7-8-5e; Calvin 3, nw ne se, 7-8-5e. Amerada Pet. Corp., Gossland 2, se ne sw, 8-5-8e; Gossland 3, ne se sw, 8-8-5e. Pure Oil Co., Wiley 4, nw sw nw, 8-8-5e. Shell Pet. Corp., Wiley 1, sw nw nw, 8-8-5e; Wiley 2, nw c, 8-8-5e. Tidal Oil Co., Smith 1, nw sw se, 8-8-5e. Wilcox O. & G. Co., Wilson 2, sw nw se, 8-8-5e. Laurel O. & G. Co., Billington 1, se ne nw, 18-8-5e. Continental Oil Co., Neghnguit 1, owd, se c nw, 18-7-4e. Sinclair O. & G. Co., Blandin 12, se sw sw, 24-7-4e. Gypsy Oil Co., Bruno 3, owd, sw ne nw, 25-7-4e. Shell Pet. Corp., Livingston 1, sw c se, 33-7-5e.

SEMINOLE COUNTY—Skelly Oil Co., Shepherd 4, ne sw nw, 6-9-6. Skelly and Atlantic, Lottie 2, se nw nw, 6-9-6. Magnolia, Killing 2, sw nw nw, 14-8-5e. Sinclair, Jefferson 1, se ne se, 23-5-7e.

STEPHENS COUNTY—Magnolia, Worrell 5, nw cor ne nw, 19-1s-8w. Mudge Oil Co., Grace 1, c sw, 15-1s-5w. Pace et al, Bush 1, ne c nw, 3-2s-8w, owd.

KANSAS

BUTLER COUNTY—Empire O. & R. Co., Willets 6, se c sw, 22-27-5e. Phillips Pet. Co., Green 1, nw sw nw, 23-27-5e. Empire O. & R. Co., Hutchinson "B" 5, nw c ne, 27-27-5e; Willets 7, ne nw, 27-27-5e.

EDWARDS COUNTY—British American Oil Co., McCarthy 1, ne c nw, 31-25-17w.

GREENWOOD COUNTY—Phillips Pet. Co., Green 1, nw c ne, 22-22-10e. Empire O. & R. Co., Schwab 15 "A," se sw ne, 25-22-12e. Derby Oil Co., Walter 1, ne nw nw, 21-22-13e. Amerada, Luthi 5, se nw sw, 29-22-13e. Empire O. & R. Co., Edwards 1 "B," nw ne se, 21-23-11e; Edwards 10, se sw ne, 21-23-11e. York State Oil Co., Rice 1, sw ne ne, 21-23-11e. Empire O. & R. Co., Hillman 1, nw se ne, 35-23-11e. Marshall et al, Bonnett 8, sw c nw, 13-24-12e.

MARION COUNTY—Frank et al, Schlotthauer 1, ne se nw, 25-19-3e.

RICE COUNTY — Higgins & Starbuckle, Scharr 1, ne c sw, 21-20-10w.

RUSSELL COUNTY—Mid-West Explo- Co., Austin 31, sw c, 30-12-15w; Booth 4, ne nw ne, 29-11-15w. Liggett et al, Stewart 1, se c, 17-11-15w.

SEDGEWICK COUNTY — Morgan et al, Fitzgerald 1, nw c ne, 5-26-1w.

CALIFORNIA

BELRIDGE—Union Oil Co., Kink 4, 30-28-21.

COALINGA—Bullion Mining Co., No. 2, 20-19-15.

ELWOOD—J. E. O'Donnell, Campbell 1, 23-4-29.

KERN COUNTY—George F. Getty, Inc., Farnell 1, 21-29-27.

HUNTINGTON BEACH — Featherstone & Preston, H. B. 1, 14-6-11.

LONG BEACH—Shell Co., Alamitos 39, 29-4-12; Pickler 11, 29-4-12. Delaney Pet. Corp., Anderson Comm. 1, 24-4-13. General Pet. Corp., Morris 1, 13-4-13. Graham-Loftus Oil Corp., Bank 2, 19-4-12; Bank 3, 19-4-12. Hancock Oil Co., Signal 17, 19-4-12. Southern Calif. Drilling Co., Miller 2, 29-4-12. South Basin Oil Co., No. 4, 30-4-12.

McKITTRICK—Franco Western Oil Co. No. 10, 8-30-22.

MIDWAY—Standard Oil Co., No. 61, 7-32-24. Cypress Pet. Co., No. 15, 22-32-23.

SAN LUIS OBISPO COUNTY—Texas-Pacific Coal and Oil Co., No. 1, 25-32-14.

SANTA FE SPRINGS—George F. Getty, Inc., S. F. S. 27, 6-3-11. Italo Pet. Corp. of America, Archer 1, 6-3-11; Archer 2, 6-3-11. Standard Oil Co., Orr 5, 1-3-11. General Pet. Corp., Santa Fe 211, 5-3-11; Santa Fe 221, 5-3-11.

SANTA MARIA — Rice Ranch Oil Co., Brookshire 11, 23-9-34.

TULARE COUNTY—Angiola Oil Co., No. 1, 27-22-23.

ARKANSAS

CALHOUN COUNTY—Amerada Pet. Corp., Matlock 1, 330 n and w se c se sw, 10-12-13.

UNION COUNTY—Lion Oil Ref. Co., C. B. Nash 3, 330 n and w se c ne sw, 6-17-13. Skelly Oil Co., Kelly 1, 330 n 990 w se c ne se, 9-17-14. Root Refineries & Oil Well Corp., Kelly 2, 150 e 330 s nw c ne nw se, 9-17-14; Gregory 1, 150 n 150 e sw c ne sw, 10-17-14. Calgo Oil Co., Primm 1, 150 e 150 s nw c ne ne, 9-18-17.

TEXAS

ARCHER COUNTY — Atlantic Oil Prod. Co., Dallas, Lyles 1, S 7, Hooper & Wade sur, 150 ft from n and 21 ft from w line. American Ref. Properties & Corlett & White, Wichita Falls, Cernosek 4, 2409, T.E.&L. sur, 30 ft w of No. 3.

ANDERSON COUNTY—Humble O. & R. Co., Houston, Todd 1, M. Roberts sur, 850 ft from n and 1000 ft from e line.

BROWN COUNTY—Midland Oil Co., Fort Worth, Hill 1, S 8, E. T. Ry. sur, 737 ft from w and 150 ft from s line. States Oil Corp., Eastland, Allen 2, No. 789, J. Delgado sur. Humble O. & R. Co., Wichita Falls, Kilgore A7, No. 241, J. Delgado sur, 584 ft n of No. 5. F. W. Stone & Co., Cross Plains, Tate 1, No. 796, S. Lackerman sur, 750 ft from w and 150 ft from s line. Brock & Switzer, Brady, Dunn 1, No. 203, I. D. Flores sur, 1104 ft from sw and 150 ft from se line. Stout & Bradstreet, Fort Worth, Stout 15, No. 165, W. B. Smith sur. Lloyd Oil Corp., Fort Worth, Collier 11, No. 139, W. A. Smith sur, 300 ft e of No. 10. Kone Prod. Co., Cisco, Hickman 20, T. Benson sur, 450 ft from n and 750 ft from w line; Hickman 21, 450 ft from n and 1650 ft from w line. Humble O. & R. Co., Cisco, Byler 8, S 43, T.&N.O. Ry. sur, 300 ft w of No. 7. J. D. Burns et al, Cross Plains, Newton 10, P. Curlong sur, 300 ft n of No. 8. Mac T. Anderson, Rising Star, Williams 1, No. 283, S. Jones sur, 750 ft from e and 450 ft from s line. C. C. Outhier et al, Brownwood, Anderson 3, No. 282, S. Jones sur, 150 ft from n and 300 ft from e line. R. E. Pitts, Cross Plains, Harrell 1, B 2, C.C.S.L. sur, 200 ft from n and e lines.

BASTROP COUNTY — Atlantic Oil Prod. Co., Dallas, Yost 1, A. Garcia sur, 168 ft from nw and 150 ft from ne line. Gulf Prod. Co., Houston, Beel 2, C. A. West sur, ne corner. Cranfill & Reynolds, Cisco, Yost 1, Garcia sur, 450 ft from nw and ne lines; Yost 2, 300 ft nw of No. 1.

CALLAHAN COUNTY—E. W. Ames, Cisco, Finley 1, S 11, D.&D. Asy. sur, 1450 ft from n and 450 ft from e line. St. Mary's O. & G. Co., Moran, Pruitt 5, 2287, T.E.&L. sur, 500 ft n of No. 4. Moutray Oil Co., Abilene, Hickman 28, S 149, B.B.B.&C. sur, 357 ft s of No. 24. J. F. Mason, Fort Worth, Ogle 10M, 2974, T.E.&L. sur, 25 ft s of No. 22. Texas Co., Wichita Falls, Hatchett 9, S 29, D.&D. Asy. sur, 300 ft s of No. 6. C. B. Holmes et al, Baird, Hickman 1, S 2, se corner. Texas Co., Wichita Falls, Bush 1, S 2, C.T.&M. sur, 1200 ft from n and 1972 ft from e line. Reiter-Foster Oil Corp., Abilene, Hatchett 11, S 24, D.&D. Asy. sur, 645 ft from w and 450 ft from s line. W. B. Flynn, Beaumont, Skelley 17, 2281, T.E.&L. sur. Moutray Oil Co., Abilene, Hickman 26, S 149, B.B.B.&C. sur, 377 ft s of No. 24. E. C. Mead et al, Cisco, Finley 1, S

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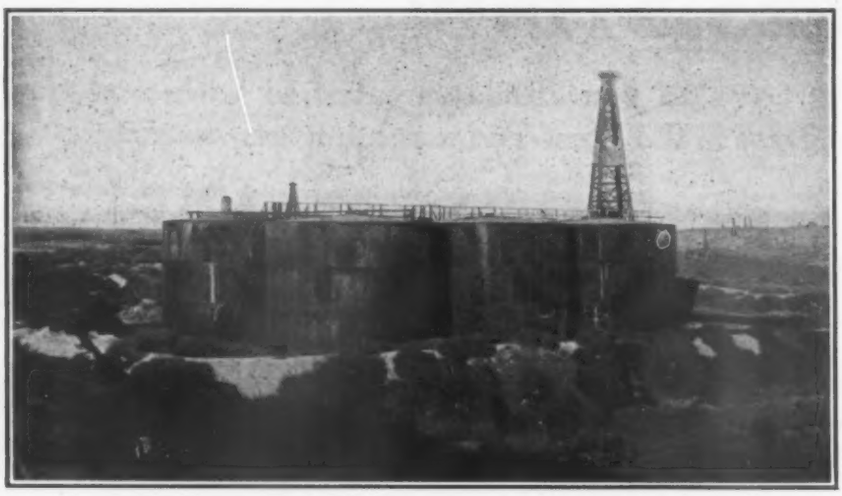

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76, Bayland Asy. sur, 150 ft from s and e lines. E. N. Schaffner et al, Cross Plains, Debegory 1, W. G. Anderson sur, 150 ft s of center of n line. Prairie O. & G. Co., Ranger, Gilliland 1, G. M. Vigal sur, 150 ft from e and 128 ft from s line. Malone Bros., Cisco, Berry 1, S 70, Bayland Asy. sur, 150 ft from s and e lines. Dickey Oil Co., Cisco, Wheeler 1, S 26, D.&D. Asy. sur, 450 ft from e and 150 ft from s line. Reiter-Foster Oil Corp., Tulsa, Hatchett 8, S 24, D.&D. Asy. sur, 450 ft from e and 413 ft from s line.

CALDWELL COUNTY—Gulf Prod. Co., Houston, Conley 1, A. Floyd sur, 150 ft from s and w lines; Conley 2, 150 ft from s and e lines; Conley 3, 150 ft s of center of n line; Coney 4, 150 ft from n and nw lines. J. S. Abercrombie Co., Houston, Moses 2, G. Hinds sur, 300 ft e of No. 1. Guerrin & Gaston, Corsicana, Davilla 1, I. Weldon sur, se corner. Shell Pet. Co., Luling, Carter 1, G. Hinds sur, 150 ft from n and w lines. Crenshaw Oil & Drilling Co., Austin, Jolly 1, W. Barber sur, se corner. Stover & May, San Antonio, Bell 1, B 24, Luling sur, 20 ft from n and w lines of Lot 5. Sun Oil Co., Dallas, Malone 3, A. Floyd sur, 300 ft se of No. 1; Malone 4, 1033 ft from nw and 150 ft from ne line. Roxana Pet. Corp., Dallas, Smith 2, A. Floyd sur, 477 ft from w and 109 ft from s line; Smith 3, 150 ft from e and 109 ft from s line. Shell Pet. Co., Luling, Smith 4, A. Floyd sur, 150 ft from w and 109 ft from s line. E. R. Brann, San Antonio, Carter 1, G. Hinds sur, 150 ft from s and w lines.

COLEMAN COUNTY — Continental Oil & Prod. Co., Dallas, Overall 3, No. 700, J. A. Barclay sur, 600 ft e of No. 2. States Oil Corp., Eastland, Morris 3, S 190, A. Area sur, 450 ft from e and 1350 ft from s line. Duncan & McNell, Cross Plains, Golson 1, J. Dockrell sur, 150 ft from n and 2400 ft from w lines. Independent O. & G. Co., Fort Worth, McCord 3, No. 700, J. Barclay sur, 800 ft from w and 200 ft from s line. Midwest Explo. Co., Amarillo, Gill 1, No. 69, E. Mudd sur, 250 ft w of center of e line. J. F. McManmon, San Angelo, Hill 2A, No. 664, S. Sprague sur, 500 ft from n and e lines. Towers & McKanna Inc., Wichita Falls, Moody 3, S 10, J. Scott sur, No. 665, 30 ft s of No. 2. Independent O. & G. Co., Midland, McCord 4, No. 700, C. H. Barclay sur, 1170 ft from e and 200 ft from s lines. Red Bank Oil Co., Tulsa, Okla., Blair 1, S 18, B 1, G.H.&H. sur, 300 ft from n and 2310 ft from e line.

COOKE COUNTY—Pure Oil Co., Fort Worth, Embry 3, T. J. Moses sur, 150 ft from s and w lines.

CHAMBERS COUNTY — Gulf Prod. Co., Houston, Lost Lake 2, No. 11681, East central. Bashara Oil Co., Houston, Dutton 1, H. Griffith sur, se corner

DUVAL COUNTY — Sun Oil Co., Dallas, Norton 1, S 250, G.B.&C.N.G. sur, 150 ft s and e lines. Humble O. & R. Co., Houston, Kohler 11, No. 166, 165 ft from s and e lines of S 166; Kohler 19, No. 395, 1155 ft from n and 165 ft from w line S 395.

ERATH COUNTY—S. E. Jackson, Stephenville, Fuler 1, M. Goff sur, south central.

EASTLAND COUNTY — P. B. Goodwin, Breckenridge, Parker 2, W. Van Norman sur. Garrett & Moore et al, Eastland, Dolberry 1, S 10, B 2, H.&T.C. sur, 150 ft from n and w lines.

FORT BEND COUNTY — Sun Oil Co., Beaumont, Kasperek 4, S. Miller sur, 50 ft s of No. 1. Texas Co., Houston, Dipple 1, D. W. Anthony sur, 50 ft from w and 118 ft from s line. H. G. Nelms, Wichita Falls, Blakely 3, Blk. E, Drew sur, nw corner of Lot 5. Bowden Oil Co., Wichita Falls, Overley 4, C. E. Drew sur, 15 ft from s and 258 ft from e line Lot 6.

FRIO COUNTY—Austin Johnson et al, Duluth, Minn., Eschenburg 1, No. 788, E. Gallagher sur, 1250 ft from e and 1625 ft from s line.

GRAY COUNTY—Gulf Prod. Co., Houston, Holmes 4, S 87, B 3, I.&G.N. sur, 330 ft from w and 990 ft from s line.

GOLIAD COUNTY — Milam Drilling Co., San Antonio, Pettys 1, Ybarbo sur, east central.

GLASSCOCK COUNTY—Gibson & Johnson, Abilene, Mann 1, S 6, B 33, Twp. 5s, 1320 ft from n and w lines.

HARRIS COUNTY—T. W. Horn, Houston, Fee 31, J. B. Jones sur, 21 ft from n and 440

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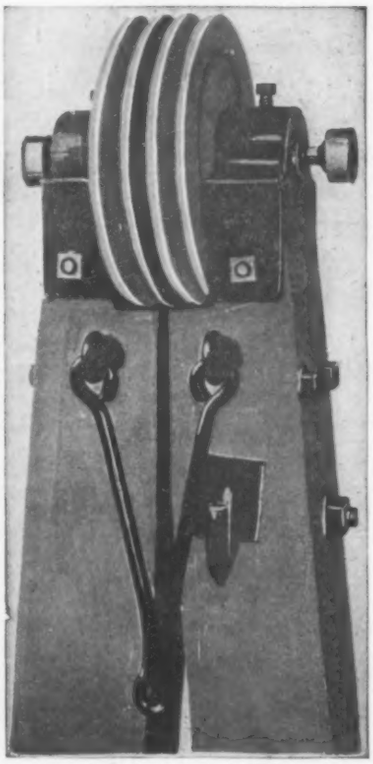

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ft from w line. Humble O. & R. Co., Houston, Warren 5, H. Ehrenberg sur, 150 ft from s and 400 ft from e line. Harrison Oil Co. & Abercrombie, Houston, Ritter 3, No. 51, J. Hamilton sur, 170 ft w of No. 2. Texas Co., Houston, House 22, M. Owens sur, 400 ft nw of No. 20.

HARDIN COUNTY—Acorn Oil Co., Beaumont, Paraffine 68, Blk. 7, Knight sur, 38 ft from n and 220 ft from e line.

HOWARD COUNTY—Gulf Prod. Co., Fort Worth, Chalk 8, S 125, B 29, W.&N.W. sur, 990 ft from w and 330 ft from s line. Plymouth Oil Co., Pittsburgh, Panna., Kloh 1, S 5, B 32, 330 ft from s and e lines. Taylor-Link Oil Co., San Angelo, Kloh 2, S 3, B 32, 660 ft from w and 150 ft from s line.

JONES COUNTY—Texas Co., Wichita Falls, Carter 4, S 13, B 19, T.&P. sur, 626 ft n of No. 2; Carter 5, 626 ft n of No. 4. Cosden & Co., Inc., Fort Worth, Brickley 5, S 50, B 18, T.&P. sur, 959 ft w of No. 4. Independent O. & G. Co., Fort Worth, Smith 2, S 51, B 18, T.&P. sur, 330 ft from n and e lines; Smith 3, 965 ft from e and 330 ft from s line. Snowden & McSweeney Co., Fort Worth, Brickley 5, S 18, B 50, T. & P. sur, 639 ft w of No. 12. Phillips Pet. Co., Bartlesville, Okla., Low 1, S 15, B 19, T.&P. sur, 330 ft from s and e lines. Marland Oil Co., Fort Worth, Mason 5, S 18, B 19, T.&P. sur, 330 ft from s and w lines. Marland Oil Co., Fort Worth, Mason 6, S 18, B 18, T.&P. sur, 330 ft from n and e lines.

JEFFERSON COUNTY—Yount-Lee Oil Co., Beaumont, Fee 22, B 5, J. Douthitt sur, 289 ft from s and 663 ft from w line.

LIBERTY COUNTY—Sun Oil Co., Beaumont, Mitchell 18, M. G. White sur, 101 ft n of No. 17; Mitchell 19, 185 ft n of No. 12; Mitchell 20, 150 ft n of No. 19. Union Exploration Co., Houston, Stewart 1, B 52, A. McNeil sur, 250 ft from n and 1200 ft from w line. Humble O. & R. Co., Houston, Guedry 24, J. Devore sur, 75 ft n of No. 8. Gulf Prod. Co., Houston, Wm. Chambers 5, M. G. White sur, 150 ft n of No. 3. Liberty Pet. Co., Liberty, Turner 2, M. G. White sur, 250 ft w of No. 1.

MAVERICK COUNTY—Rycade Oil Corp., Houston, Chittim 3, S 116, B 7, I.&G.N. sur, 10 ft from w and 255 ft from s line.

MATAGORDA COUNTY — Rycade Oil Corp., Houston, Hudson 4, S 22, H. Parker sur, 50 ft from n and 750 ft from w line.

McMULLEN COUNTY—J. F. Locke, McAlester, Okla., Genser 1, J. T. Robbins sur, west central.

MILAM COUNTY—Texas Pet. Dev. Co., Cameron, Niehaus 13, T. J. Chambers sur, 300 ft se of No. 11.

MOORE COUNTY — Phillips Pet. Corp., Bartlesville, Okla., Stlla 1, S 192, B 3, T.&N.O. sur, 330 ft from n and e lines.

NUECES COUNTY — Alexander & Smith, Houston, Bowers 1, S 47, King sur, 370 ft from w and 150 ft from s line. Houston Oil Co., Houston, Anderson 1, S 34, Benton sur, 650 ft from s and e lines.

PANOLA COUNTY — Gardner & Nemours Corp., Shreveport, La., Brumble 4, B. C. Jordan sur, ne corner.

PALO PINTO COUNTY—Ashe Synd., Fort Worth, Hart 1, S 36, B 4, T.&P. sur, 330 ft from s and w lines. J. E. Merritt, Mingus, Hill 1, B. S. L. sur, 130 ft from w and 160 ft from s line.

REFUGIO COUNTY — Union Exploration Co., Houston, Adkins 1, B 10, Refugio sur, 150 ft from n and e lines; Lamber 1, J. A. Lambert sur, 410 ft from e and 250 ft from s line.

RUNNELS COUNTY—G. W. Bryce et al, Canton, Ohio, Lang 1, No. 262, A. Williams sur, 230 ft from nw and 6950 ft from ne line.

SHACKLEFORD COUNTY—L. H. Wentz, Eastland, Mathews A1, S 59, E. T. Ry. sur, 50 ft n of No. 1. E. J. McCurdy, Mineral Wells, Smith 1, C. Ferguson sur, 1350 ft from nw and se lines. L. B. Tannehill, Albany, Mathews 10, S 58, E. T. Ry. sur, 400 ft w of No. 7. C. C. Cady, Moran, Burns 1, S 6, L.A.L. sur, 150 ft w of center of e line. Wichita Prod. Co., Wichita Falls, Meyers 5, S 1, G.H.&H. sur. Roeser & Pendleton, Inc., Fort Worth, Cook A84, S 60, E. T. Ry, sur; Cook A2, S 83, E. T. Ry. sur, 220 ft from e and 831 ft from n line. Roeser & Pendleton, Inc., Fort Worth, Cook A3, S 83 E. T. Ry sur, 220 ft w of center of e line. Tannehill, Kiser & Fleming, Albany, Mathews 4, S 34, E. T. Ry. sur, 350 ft nw of No. 1. Atlantic Oil Co., Dallas, Green 1, S 62, B 12, T.&P. sur, 150 ft from n and e lines. Hyde & McBest, Albany, Walker 1, S 8, B 11, T.&P. sur, 177 ft e and 225 ft from s line. J. E. Lake et al, Dallas, Davis 2, 535, T.E.&L. sur, 1282 ft from n and 405 ft from e line. Less Combest et al, Mineral Wells, Alexander 63, 3, S 15, L.A.L. sur, 150 ft from w and 450 ft from s line; Snyder 1, S 33, L.A.L. sur, 450 ft from n and 660 ft from e line; Elliott 1, S 8, L.A.L. sur, 660 ft from n and 450 ft from e line; Alexander 4, S 15, L.A.L. sur, 450 ft from s and w lines. Roeser & Pendleton, Inc., Fort Worth, Cook A27, S 61, E. T. Ry. sur, 289 ft from e and 81 ft from w line; Cook A28, 1090 ft from s and 1716 ft from w line; Cook B8, S 61, E. T. Ry. sur, 281 ft from s and 150 ft from e line. Union Oil & Mining Company, Tulsa, Okla., Huskey 31, 548, T.E.&L. sur, 300 ft e of No. 30.

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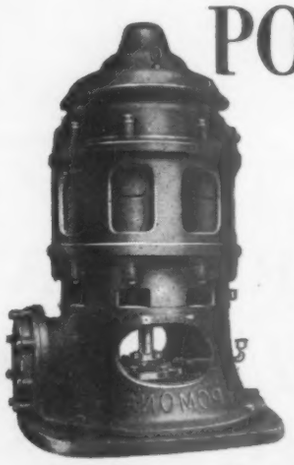

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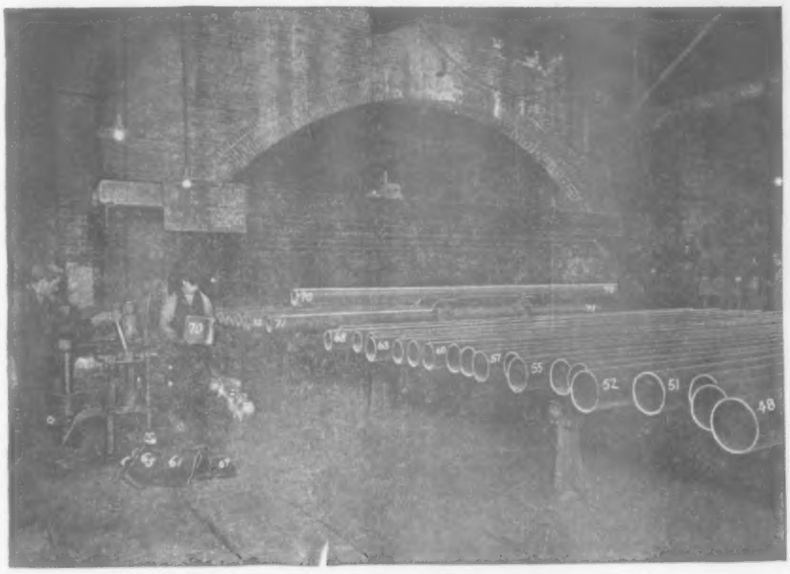

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THROCKMORTON COUNTY—R. B. Field, Albany, School 1, S 11, Travis C. S. L. sur, nw corner. C. W. James, Albany, Kunkel 1, No. 1, S. P. Ry. sur, 150 ft from s and e lines.

TAYLOR COUNTY — Mid-Continent Pet. Corp., Tulsa, Okla., Taylor 1, No. 120, G. C. S. L. sur, 990 ft from e and 215 ft from s line.

UPTON COUNTY—T. P. Coal & Oil Co., Ranger, Lane A 22, S 5, G.C.&S.F. sur, 1650 ft from s and 2310 ft from w line.

WICHITA COUNTY—Gulf Prod. Co., Fort Worth, Waggoner D 1, M. A. Willis sur, 1050 ft from e and 150 ft from s line. Ryan Consolidated Pet. Corp., Bartlesville, Okla., Nance 102, S. O. Fowler sur, 501 ft e of No. 100. Panhandle Ref. Co., & Hines, Wichita Falls, Waggoner 12, S 2, G.C.&S.F. sur, 300 ft e of No. 11; Waggoner 13, 300 ft w of No. 10. J. F. Cottom, Wichita Falls, Ferguson 2, L. Neatherly sur, 300 ft e of No. 1.

WEBB COUNTY—O. W. Killam, Laredo, Bruni 27, B 65, Albercas sur, 947 ft from w and 2903 ft from s line; Bruni 26, 950 ft from w and 1540 ft from s line; Fee 1, No. 457, 150 ft from s and w lines. Sun Oil Co., Dallas, Yeager-Stroman 8A, No. 5, Las Animas sur, 300 ft s of No. 7A.

WILBARGER COUNTY — J. E. McKanna, Wichita Falls, Waggoner B4, S 32, B 4, H.&T.C. sur, 150 ft from s and e lines. J. B. Baker Jr., et al, Wichita Falls, Waggoner 9B, T. D. Purnell sur, 1115 ft from n and 1500 ft from e line. Fain-McGaha Oil Corp., Wichita Falls, Waggoner S 23, S 24, B 4, H.&T.C. sur, 300 ft s of No. 19; Waggoner 24, 300 ft s of No. 11; Waggoner 25, 150 ft from s and e lines. Texas Co., Wichita Falls, Waggoner 01, E. Fuller sur, 739 ft from s and 3055 ft from e line. Easter Oil Corp., Wichita Falls, Waggoner A 2, S 26, B 4, H.&T.C. sur, 400 ft e of No. 1. Golding & Cochran, Wichita Falls, Waggoner H 2, S 32, B 4, H.&T.C. sur, 150 ft from s and w lines. Cosden & Co., Inc., Fort Worth, Waggoner 31B, S 31, B 4, H.&T.C. sur, 300 ft s of No. 30B.

WINKLER COUNTY — Barnsdall Oil Co., Tulsa, Okla., Morton 3, S 26, B 12, P.S.L. sur, 660 ft n of No. 1. Henshaw Oil Corp., San Angelo, Hendrick 1, S 28, B B5, 330 ft from s and w lines. Skelly Oil Co., Tulsa, Okla., Hendrick C 1, S 10, B B12, 495 ft from n and 330 ft from w line. Shell Pet. Corp. & Texas Co., Fort Worth, Hendrick A11, S 29, B B5, 1180 ft from w and 330 ft from s line. Dixie & Southern Crude Oil Purchasing Co., Fort Worth, Hendrick B4, S 4, B B12, 330 ft from n and 1320 ft from w line.

WHARTON COUNTY—Hearte Oil Co., El Campo, Brown 1, S 35, E. T. Ry. sur, 400 ft from n and 340 ft from w line. Gulf Prod. Co., Houston, Bay 5, S. F. Austin sur, sw corner. H. F. Heep et al, Houston, State 1, J. F. Weed sur, center. Gulf Prod Co., Houston, Chase 16, S. F. Austin sur, 50 ft from s and w lines; Banker 4, S. F. Austin sur, 510 ft sw of No. 3.

YOUNG COUNTY—Mook-Texas Oil Co., Fort Worth, Davis 9, 1487, T.E.&L. sur, 366 ft ne of No. 7; Davis 10, 306 ft n of No. 3.

ZAPATA COUNTY—O. W. Killam, Laredo, Benavides 7, J. M. Pereda sur, 425 ft from nw and 770 ft from sw line.

LOUISIANA

ACADIA PARISH — Cline, Smith & Cline, Lake Charles, Concklin 8, 45-9s-2w, 804 ft n and 621 ft w of se c. The Texas Co., Shreveport, Rayne Hrs. 4, 40-9s-2w, 50 ft s of n l and 50 ft e of w l of Sec. Yount-Lee Oil Co., Beaumont, Texas, Houssiere-Latrielle 6, 47-9s-2w, 5383 ft e and 658 ft n of swc.

CADDO PARISH—Thomas & Fitzsimmons, Shreveport, Muslow Oil Co. 7, 31-21n-15w, 150 ft n and 150 ft w of sec ne ne.

CALCASIEU PARISH—Union Sulphur Co., Sulphur, Fee 729, 29-9s-10w, 1961 ft n and 1710 ft w of center. Vacuum Oil Co., Houston, Miller 22, 9-10s-9w, 670 ft e and 50 ft n of center. Vacuum Oil Co., Houston, Miller 23, 9-10s-9w, 970 ft e and 500 ft n of center.

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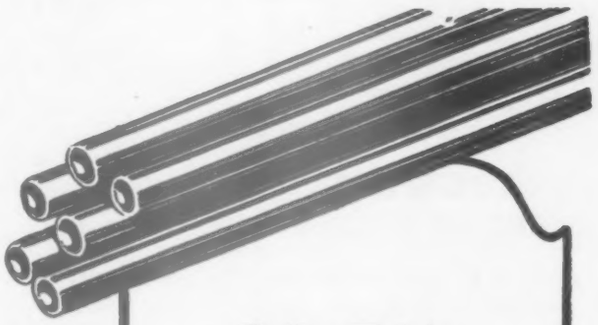

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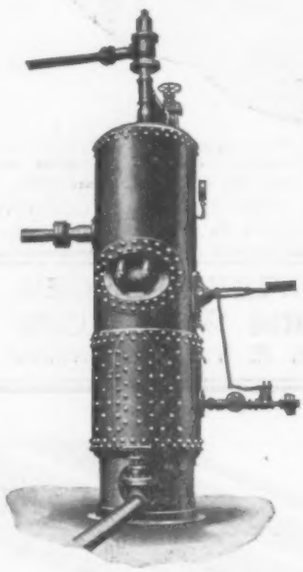

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1874 ft w and 756 ft s of sec Sec. 13 in Sec. 36. Shell Pet. Corp., Houston, Mrs. J. B. Watkins 6, 8 12s-12w, 1486 ft e and 885 ft s of nwc.

DE SOTO PARISH—La. Public Utilities Co., Mansfield, Rambin 1, 13-12n-12w, 200 ft n and 200 ft e of sw c se.

IBERVILLE PARISH—Standard Oil Co. of La., Shreveport, Schwing Lbr. & Shingle Co. 1, 75-9s-10e, 500 ft n and 500 ft w of se c ne ne.

OUACHITA PARISH — Southern Carbon Co., Monroe, Fairbanks 10, 43-20n-4e, 405 ft n and 230 ft w of n c Sec. 34 in Sec. 43. United Carbon Co., Monroe, Cosmos Fee 3, 6-19n-5e, 660 ft n and 660 ft e of center.

RICHLAND PARISH—Ouachita Nat'l Gas Co., Monroe, C. G. Pardue 3 (relief well), 6-15n-6e 2695 ft s and 1940 ft w of ne c. Ouachita Nat'l Gas Co., Monroe, C. G. Pardue 4, 5-15n-6e, 990 ft s and 1980 ft e of nwc. Richland Prod. Co., Shreveport, Sartor D-1, 32-16n-6e, 1419 ft n and 693 ft w of se c.

SABINE PARISH—Wade J. Garnier, Tr., Amite, Bowman-Hicks Lbr. Co. 1, 16-7n-12w, 529 ft w and 174 ft n of se c ne nw.

UNION PARISH—McDonald Bros., El Dorado, Ark., Frost-Johnson 1, 18-23n-1e, 883 ft w and 190 ft s of ne c ne se. McDonald Bros., El Dorado, Ark., Frost-Johnson 2, 18-23n-1e, 1100 ft s and 150 ft e of nw c sw ne. W. D. Wingfield, El Dorado, Ark., Clark B-1, 17-23n-1e, 330 ft s and 330 ft e of nw c. W. D. Wingfield, El Dorado, Ark., Clark 4, 7-23n-1e, 330 ft n and 330 ft w of se c se ne.

WEBSTER PARISH — Cotton Valley Corp., Shreveport, G. D. Hope 19, 24-21n-10w, 1412 ft s and 660 ft e of nw c.

Bottom of Deepest Well Unusually Cool

San Angelo, Texas. — Comparatively cool temperatures prevail in the lower depths of the Texon Oil & Land Company's University 1-B, Group No. 1, which has brought a world's record to to Big Lake field, West Texas district, through having drilled to a depth of 8463 feet. Temperature tests made at the 8300-foot level registered 170 degrees, but the presence of oil and gas in the hole from the 6200-foot level serves to hold down the temperature.

The above deep test is drilling with cable tools in hard black lime, making five to ten feet daily, with 5 3/16-inch casing cemented at 6184 feet. Although the well has 2279 feet of open hole, no appreciable trouble from cavings has developed. Occasional heads of high gravity sweet oil is made by the well from the last pay encountered at 6284-6299 feet. The total cost of this deep test is less than $200,000, according to Frank T. Pickrell, vice president and general manager, and operations are to be continued as long as possible to make fair progress.

The Big Lake field deep test recorded a bottom hole temperature of 122 degrees Fahrenheit at the 5700-foot level; 135 degrees at 6500 feet; 152 degrees at 7000 feet; 161 degrees at 8000 feet; and 170 at 8300 feet. Magnolia Petroleum Company's wildcat deep test on the W. E. Whitehead ranch in northeastern Val Verde County, and about 100 miles southeast of the above test, recorded a temperature of 178.76 degrees Fahrenheit in a dry hole at the 6600-foot level, and would have reached the boiling point in temperature at about the 8200-foot level. The Whitehead test was abandoned at 6725 feet as a failure.

Starting Test in Western Tennessee

Shreveport, La.—The Standard Oil Company of Louisiana is rigging up a heavy cable tools and steel derrick for a test in Decatur County, Tennessee, it was announced here this week. The drilling rig was shipped from Tulsa to Parsons and hauled about 12 miles overland to the W. C. Myatt farm where location for the test has been made. The territory is not sectionised and the location is described as being on the west side of Highway No. 69, a little northwest of the old McKendree school in the south-central part of the county.

The location is said to be on the north end of an anticlinal fold that was discovered and mapped by H. D. Easton, Shreveport geologist. He named it the Old Dunbar structure.

Geologically the structure is located in the Paleozoic rocks where they disappear beneath the Cretaceous just west of the Tennessee River. Surface formation is Silurian of which but a thin section remains and the drilling will practically begin in the very top of the Ordivician.

About five miles southwest of the Standard Oil Company's location on the southwest end of the same structure a test is below 200 feet on the J. A. Montgomery farm by the Chester County Oil Company, composed of business men of Hendersonville, Tennessee. By a mutual agreement it is reported the two companies hold acreage around the test of the other.

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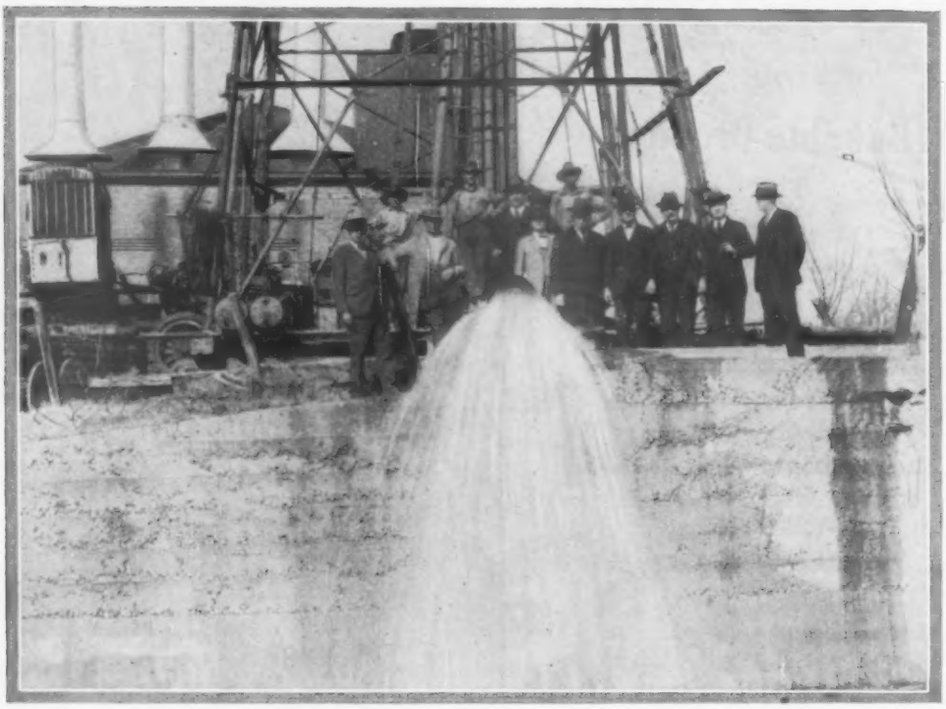

p-870-L

Portable Rotary Waukesha - Driven Drills at San Antonio

For Water Too

Waukesha Oil Field Power Units not only drill for oil but for water too. They are also used to pump water and oil over long distances. At San Antonio they are shown just after bringing in a 1000 foot well, an addition to the city's water supply.

Waukesha engines are available to the oil industry in both completely enclosed power units and in stationary units. They are made in power from 25 to 300 H. P. Special equipment adapting them to pumping and both rotary and cable tool drilling is available. Write for full information.

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Improved Trimo Pipe Wrench

TRIMONT MANUFACTURING COMPANY

Trimont Manufacturing Company, Inc., Roxbury, Massachusetts, makers of "Trimo" Pipe Wrench, announce the "Improved and Mightier" "Trimo" now ready for delivery. The makers have directed every effort toward bringing about a material increase in strength and safety. Although the contour of the frame has been slightly extended, the appearance of the new "Trimo" remains practically unchanged, and the parts of the old and new wrench are interchangeable throughout.

An entirely new and scientifically developed method of heat treating gives to the handle far greater strength and toughness than before. The swinging steel frame, though not materially changed in appearance, has been strengthened to such a degree that breakage is virtually out of the question even under the most trying conditions.

As a further safeguard, overlapping side lugs, an integral part of the handle, brace the frame effectively against lateral distortion or spreading. The design of these reinforcing lugs furnishes a rugged safety feature without in any way hampering the action of the frame or adding to the bulk of the wrench.

The replaceable insert, lower jaw, and the popular nut-guards which protect the adjustment, are economy and convenience features of the new, improved "Trimo."

More information may be had from the company.

New Drilling Engine

FRANKLIN VALVELESS ENGINE COMPANY

The Franklin Valveless Engine Company, Franklin, Pennsylvania, have a new cable tool drilling engine.

The new type "OF" engine is of the enclosed, single cylinder, center crank, two cycle horizontal type. Its characteristic features are simplicity, accessibility, positive and automatic lubrication at all speeds, easy starting and high efficiency.

The distribution of metal in the frame is such as to secure the greatest strength and rigidity. A perfect oiling system and the prevention of dirt, sand, etc., from getting into the bearings is secured by making it entirely enclosed. It is so designed, however, that the lifting off of the sheet steel oil shield and the removal of the plate on the side makes all bearings as accessible as in an open type frame.

The cylinders are made of hard, close grain cast iron. They are completely water jacketed in all surfaces subject to the heat of combustion, are accurately machined and bolted to the frame by four heavy tie rods extending the full length of the cylinder.

The pistons are made from the same hard, close grained cast iron as the cylinder. They are so constructed that all air entering the cylinder passes entirely through them. This is very effective in preventing their overheating.

This piston rod is forged, turned and polished. It is bolted to the piston by means of a flange forged on the rod. As it does not extend through the piston no part is ever subject to the high temperature of the burning gases. Either the piston or piston rod can be furnished independently of the other.

Three rings of metallic rod packing are used. These rings require no attention, no following up, and effectively prevent the oil from leaking out of the crank case into the cylinder.

The crosshead is of steel, machined to fit the guides in the frame and proportioned to give long life without adjustment. It is fitted with a steel crosshead pin exceptionally large in diameter, hollow to reduce weight and accurately machined to fit the tapered hole in the crosshead.

American hammered piston rings are used. They are concentric, have ship-lap joints and are pinned in such a position on the piston as to bring all joints in the bottom. This is done in order that the piston itself may shut off all leakage after the rings have worn and the joints open.

Two fly wheels are used, one having a flange for attaching the clutch or belt pulley. Should it be desirable to use a clutch or pulley on each side of the engine, both wheels can be furnished with a flange. Wheels are of large diameter to make hand starting easy, are of proper weight to meet the conditions under which the engine is to run. They have a half split hub and are keyed to the shaft.

The crank shaft is made of forged steel, is of the center crank type and of very liberal proportions. Counterbalance weights are securely attached to the shaft by means of U bolts.

Connecting rods are of I beam section. Both ends are fitted with removable babbitt shells and are adjustable for taking up wear.

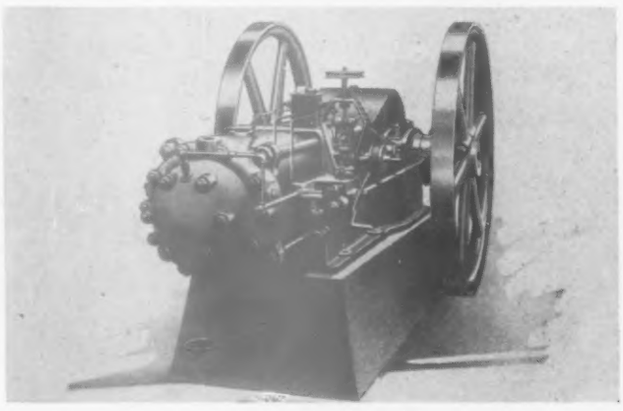
All bearings are removable babbitt shells. They are also reversible. That is, either shell will fit on either side of the journal.

High tension ignition and jump spark plug are used on the gas engine, but on the oil engine the ignition is produced by the heat of compression.

All bearings run in a bath of oil. This is made possible by using the splash system in an enclosed type of frame. The cylinder is provided with a force feed lubricator.

When using either gas or oil the type "OF" engine can be easily started by hand, by rocking the wheels back and forth, but an air-starting equipment is furnished when desired.

Further information can be secured by writing the company at Franklin, Pennsylvania.



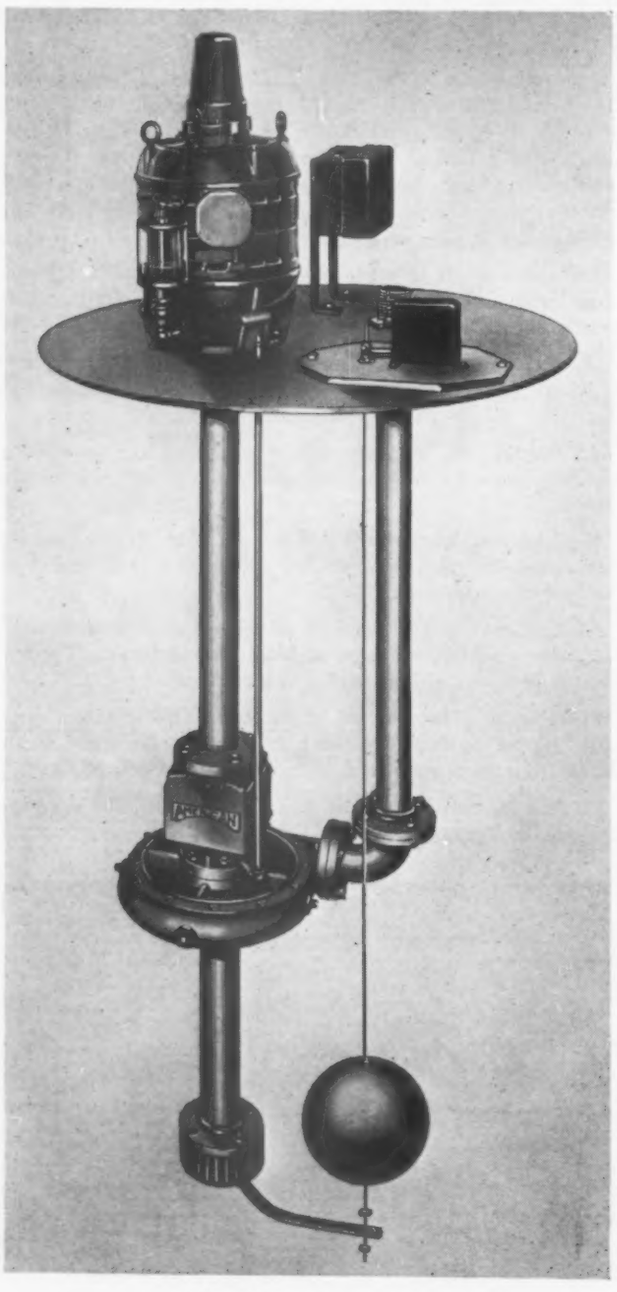
Franklin Engine

The New "American" Sump Pumps

The American Well Works has just announced a new and improved line of sump pumps having many advantages over the old type. This new line, besides being self-controlled, is highly efficient and is sturdily built to meet the unusual in service and to stand up under abuse.

The "American" type M. M. D. sump pump differs from other motor driven pumps in that it employs a hollow shaft motor in place of the old solid shaft type. This construction makes possible a simple, compact pump. By this construction, flexible couplings and thrust bearings are eliminated. The pump shaft extends up through the motor shaft, hence both motor and pump use the same thrust bearing which is mounted in the upper end of the motor, making adjustments easy.

Elimination of high motor supports is made possible as the pump supporting pipe is bolted through to a cast iron plate that in turn bolts to the motor. Regardless of distortion in the pit cover, the alignment of the pump and motor is not affected.



American Sump Pump

The pump shaft bearings consist of removable bushings. The pit plate is made of plate steel and is furnished either round or square. Pump may be had for all standard settings up to 17 feet in either single or duplex units.

All units are furnished complete with float control switch, oiling device and motor.

The American Well Works has published complete specifications and catalogs covering this new type pump which will be sent to anyone interested, without obligation.

The name of the Oil City Iron Works of Shreveport, Louisiana, manufacturers of a long line of oil field equipment, has been changed to the Brewster Company. The announcement from the company says that no other changes have been made.

Backfiller Winch

PONTIAC TRACTOR COMPANY

A backfiller winch which operates in connection with the McCormick-Deering tractor, has been announced by the Pontiac Tractor Company of Pontiac, Michigan, manufacturers of the Pontiac Air Compressor and the Pontiac Lincoln Arc Welder. The Backfiller Winch is designed to mount with either of the above units and when mounted with the compressor, allows the operations of backfilling and tamping at the same time. These units make a clean one unit designed, self-propelling machine, with the draw bar free for hauling other equipment and can be used for a variety of purposes.

The winch has a single drum with clutch and brake and takes its drive from the power drive shaft of the tractor at the rear and is mounted on the frame at this point. The unit is mounted so that it can be operated from either side and is controlled from the driver's seat.

Electrification in Petroleum Industry

"Electrification in the Petroleum Industry" is the title of a new publication just issued by the Westinghouse Electric & Manufacturing Company. It is known as Circular 1820, and is primarily for distribution among oil well operators, engineers, and anyone likely to influence the purchase of electrical equipment for the industry.

The booklet consists of 24 pages, embellished with numerous photographs, and combining brief bits of history, useful information, and a general discussion of the petroleum industry's methods, all written in oil men's language.

Power supply, drilling, pumping, lighting, transportation, refining and marketing—all are discussed with the view of indelibly impressing upon the readers' minds the many practical and economical applications of electricity in this industry.

Various sections are devoted to discussions of auxiliary equipment, arc-welding, turbine applications and condenser equipment for refining, gearing requirements, and filling station equipment.

Long descriptions of operations are avoided, partly to conserve space, but mostly with a view to retaining interest by eliminating technical details. The booklet gives a panoramic view of the whole industry, showing the numerous production steps in which electricity can serve efficiently and economically.

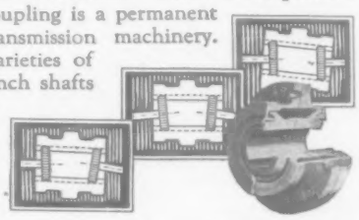
W. B. Marshall has recently been appointed sales manager of the contract engineering department of the Chain Belt Company, Milwaukee, Wisconsin. He has been associated with the company since 1921, when he was graduated from the Sheffield Scientific School of Yale University. He entered its employ as a student apprentice and after several years work in the shops and foundries he was made secretary to the general manager and later spent some time in the Chicago office. In 1926 he returned to Milwaukee and was engaged in contract engineering sales work until his recent appointment.

Replacements Banished by FAST'S COUPLING

SHUT-DOWNS for replacing pins, bushings, springs, discs or grids in flexible couplings are a thing of the past—when you standardize on the coupling that has no flexible members.

Instead, in Fast's flexible coupling, two spur gears, one on each shaft end, are completely and continuously meshed in oil with the internal gears of a floating sleeve. The shafts and sleeve turn noiselessly as one unit, allowing free angular and lateral movement.

Oil between the gear teeth, under high centrifugal pressure, carries the load. There is no power loss and the coupling is a permanent part of the transmission machinery. Built for all varieties of service from 1-inch shafts on pumps and fans, up to huge steel mill reversing drives.



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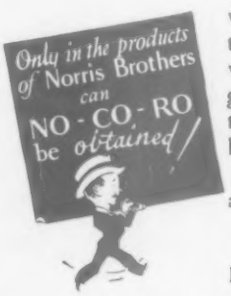

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240 pp., 29 figs., 6x9 in. Cloth. Price, $3.50, postpaid. Address: American Association of Petroleum Geologists, Box 1852, Tulsa, Oklahoma.

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SQUEAKS FROM THE BULL WHEEL

What would this country be without women?

A stag-nation I suppose.

"The new patient in Ward B is very good looking," said the nurse.

"Yes," agreed the matron, "but don't wash his face. He's already had that done by four nurses this morning."

Indignant Parent (6 a. m.)—Young man, what do you mean by bringing my daughter in at this hour?

Flaming Youth—Well, I gotta be at work by 7.

"Brother Jones," said the deacon, "can't you-all donate some small contribution to de fund for fencing in the cullud cemetery?"

"I dunno as I can," replied Brother Jones. "I don't see no use in a fence around a cementery. You see, dem what's in there can't get out, and dem what's out sho' doan wanta get in."

"In time of trial," inquired the speaker, "what brings us the greatest comfort?"

"An acquittal," interrupted a man at the back of the hall.

"Darling," cried a young wife, as darling came home from the office, "there's going to be a new grocery store in the neighborhood."

"Well, well," he exclaimed. "We certainly are prospering. We haven't exhausted our credit with the other yet."

Do you get your alimony regularly?

No, I might just as well be living with him.

"I'm so proud of my boys," said one of the happy mothers of this neighborhood, "and not one of them has ever been arrested except for speeding and on liquor charges."

"Are you a doctor?" she asked the young man at the soda fountain.

"No, madam," he replied, "I'm a fizzician."

Teacher—Jimmy, if your father owed the landlord $20, and the grocer $16, what would he pay?

Jimmy—Nothin', ma'am; we'd move.

"To what do you attribute your long life?"

"Among other things, to the fact that the sheriff still don't know who shot Jim Williams."—Life.

Friend—So glad you got your divorce, dear.

Movie Star—Yes. But not a word in the papers—they've no room for anything but this stupid election. I might as well never have had it.

Sandy was fishing. Donald, passing, asked "How are the fish today, Sandy?"

"I dinna ken," said Sandy. "I've dropped 'em a line, but so far they've made nae reply."

Father—Well, I don't have to worry any longer about how I'm going to get the money to send my boy to college.

Friend—Why not?

Father—He has made the All-State High School football team.—Life.

"I hear, Paddie, they have gone dry in the village where your brother lives," said the preacher.

"Dry, did you say," remarked Paddie. "They're parched. I've just had a letter from Mike, an' the postage stamp was stuck on with a pin."

Say, girlie, let's get married and take a long honeymoon.

Have you enough money?

No, but aren't you the girl that was left all that cash?

No.

Oh, my goodness, I beg your pardon.

First Actress—What did you do with your testimonial money?

Second Actress—I had my throat doctored.

"A farmer said to his daughter when she came home from college for her vacation:

"'Land, but you've thinned down, gal. Why, you must have lost close on to 25 pounds.'

"'Close on to it, pater,' said the college girl complacently. 'I weigh just 107 stripped for gym.'

"The father rushed at the girl and grabbed her by the throat.

"'Who in Sam Hill's Jim?' he roared.

HE CAME FROM TEXAS

By Arthur Knapp

Texas Kinney and Highpockets Richards were on their way out to Rumania. They decided that a side trip to Paris could be worth while and planned their route accordingly.

As they looked over the sights, they made comments in English, forgetting, as many American travelers do, that other languages than French may be understood. In the course of their walk, Highpockets discovered a hump-backed man approaching and remarked, "Say, Texas, watch me touch his hump for luck." However, before he could move, Highpockets found himself looking down the wrong end of the grand-daddy of all six-shooters and the hump-back remarked, "Put your hands on me and I'll blow you to hell. I'm from Texas myself."

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WASHINGTON

Call for Bids to Purchase Government Royalty Oil from Salt Creek Field, Wyoming

The Secretary of the Interior invites sealed bids to be submitted at his office, Interior Department Building, Washington, D. C., on or before noon of December 10, 1928, for the royalty oil accruing to the United States from leases on Government land within the Salt Creek Oil field in the State of Wyoming, for a period of three (3) years beginning January 1, 1929. For the calendar year 1927 the total Government royalty oil from the Salt Creek field amounted to approximately 1,920,000 barrels, and for the period from January 1 to August 31, 1928, to approximately 1,280,000 barrels, the average gravity in both years being in the range from 36.0 to 36.9 degrees A. P. I.

Bids must be based upon the highest posted field price for oil of like gravity in Oklahoma and Kansas, and or in Wyoming, whichever is the higher, and must be stated as a differential in cents per barrel from such posted price. Delivery of royalty oil will be made on each leasehold for the account of the successful bidder. Payments for the royalty oil are to be made to the Register of the United States Land Office at Cheyenne, Wyoming, on or before the fifteenth (15th) day of each month following that in which delivery is made and shall be computed on the basis of tank measurement with two (2) per cent strapping in terms of standard barrels at sixty (60) degrees Fahrenheit.

The successful bidder will be required to furnish a corporate surety bond in the sum of $250,000 conditioned upon full and complete compliance with the terms of the contract.

The Secretary of the Interior may accept any bid which in his judgment is most advantageous to the Government, and reserves the right to reject any or all bids.

Sealed bids are to be submitted to the Secretary, Department of the Interior, Washington, D. C., the envelope to be marked plainly, "Bid on Salt Creek royalty oil." No bid received after the time herein fixed for submitting bids will be considered.

Additional information can be obtained from the Geological Survey, Department of the Interior, Washington, D. C., or from the field offices of the Geological Survey at Casper, Wyoming.

ROY O. WEST, *Secretary of the Interior.*

October 30, 1928.

TRIBAL OSAGE OIL LEASES AT PUBLIC AUCTION

DECEMBER 11, 1928, BY UNITED STATES GOVERNMENT

December 11, 1928, at Pawhuska, Oklahoma, about 30,000 acres will be offered for oil leases in quarter section tracts. Bids will be for bonus in addition to royalties, 25% payable on day of sale, balance in three annual installments, with acceptable security. Within advertised area there are about 9,870 wells producing from one barrel to 400 barrels each, the total daily production for August, 1928, being about 50,300 barrels; also, there are about 50 wells drilling. All lands are now leased separately for gas. Blue print maps of area advertised, showing tracts producing oil or gas, can be had for fifty cents each, also logs of producing oil or gas wells for twenty-five cents each well. Write U. S. Superintendent, Osage Agency, Pawhuska, Oklahoma, for maps, logs or other information.

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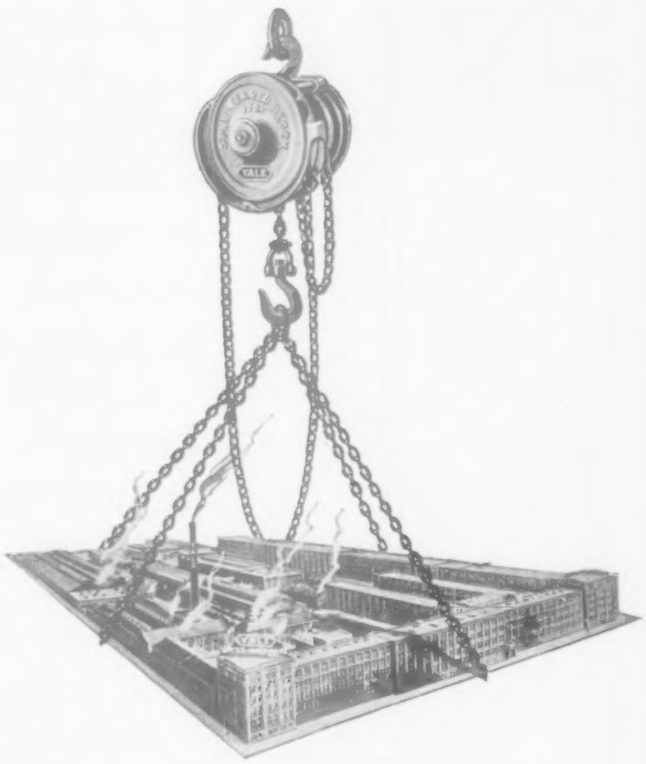

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